MINING WORLD

in this issue

Circulation This Issue: 20,642

Page 35

EPTEMBER 1953

ol. 15 No. 10

35 cents a copy
in sterling 3s

WORKING LIFE

of Eimco Loaders is yet to be realized. Most of the first loaders are still working, some of them after 20 years of continuous service — evidence of quality construction, another reason why they are preferred by mining men.

EIMCO

THE EIMCO CORPORATION

The World's Largest Manufacturers of Underground Rock Loading Machines

EXECUTIVE OFFICES AND FACTORIES · SALT LAKE CITY 10 · UTAH · U. S. A.

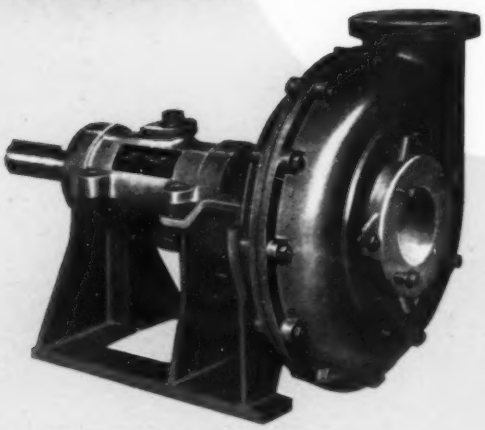
BRANCH SALES AND SERVICE OFFICES:

NEW YORK 51 52 SOUTH STREET · CHICAGO 3319 SOUTH WALLACE STREET
BIRMINGHAM ALA 3140 FAYETTE AVE · DULUTH MINN 214 E SUPERIOR ST
EL PASO TEXAS MILLS BUILDING · BERKELEY CALIF 637 CEDAR STREET
KELLOGG IDAHO 309 DIVISION ST · LONDON W 1 ENGLAND 190 PICCADILLY

IN FRANCE SOCIETE EIMCO PARIS FRANCE
IN ENGLAND EIMCO (GREAT BRITAIN) LTD LEEDS 12 ENGLAND
IN ITALY EIMCO ITALIA S.P.A. MILAN ITALY

In pumping abrasives

does the seal-water factor prevent your using Hydroseals



CENTRISEAL pump
MAXIMIX RUBBER PROTECTED

This is your answer for efficiency

A worthy companion of the world-famous Hydroseal, the Centriseal Materials Handling Pump is designed to operate entirely without sealing water. If your pulp must be delivered undiluted or if sealing water is hard to get, this is the pump for your process.

All Centriseal mechanical parts are interchangeable with those of standard Hydroseal Pumps, reducing repair parts to a minimum. In addition, all parts coming into contact with abrasives are protected by the toughest of tough rubbers—Maximix.

Our engineers will gladly tell you what the Centriseal Pump can do to reduce your abrasives-handling costs. Write or wire us today.

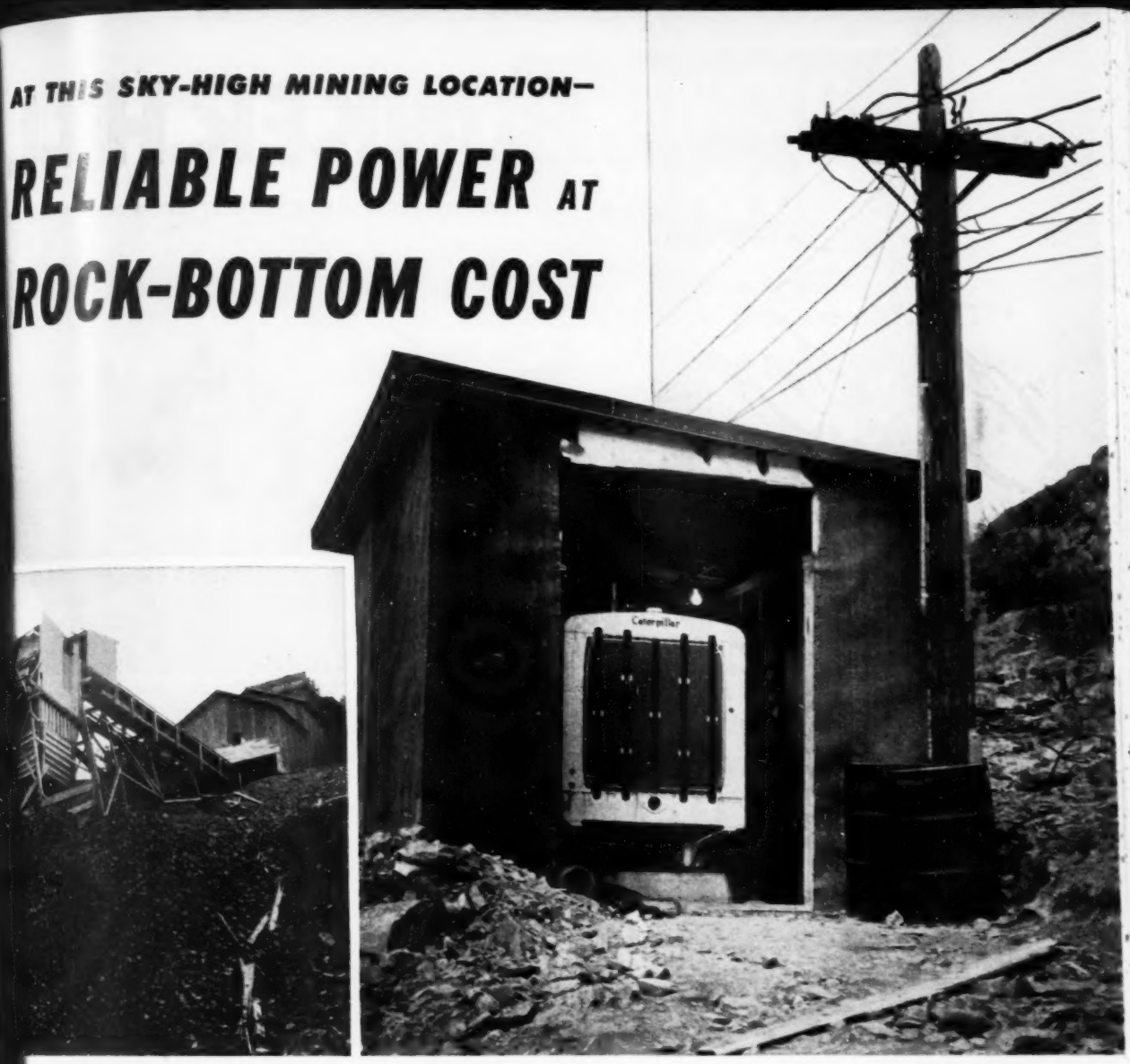
THE ALLEN-SHERMAN-HOFF PUMP CO.
Dept. J—259 E. Lancaster Ave., Wynnewood, Pa.

Representatives throughout the World

HYDROSEAL and CENTRISEAL
SAND, SLURRY & DREDGE PUMPS
MAXIMIX RUBBER PROTECTED

AT THIS SKY-HIGH MINING LOCATION—

RELIABLE POWER AT ROCK-BOTTOM COST



Nine thousand feet up in the Rockies, and 30 miles from the nearest town, is this small but highly efficient gold mine. Owned by the Crystal Hill Mining Co. of Center, Colo., it produces 100 tons of ore a day.

Reliable, economical power is a "must"—and that's why you find all-Caterpillar power here. A Caterpillar D13000 Diesel Engine *with 34,000 hours on the meter,* and a D17000 Electric Set—a "youngster" of 1,000 hours—furnish power for the mill and mine. "I bought the Cat* Electric Set," says owner John Hamm, "because of local service facilities, and because I've had such good results with other Caterpillar Engines in six years of high-altitude gold operation."

Fast service from a well-stocked Caterpillar Dealer is important in a remote mining location. When you standardize on Caterpillar power, you eliminate your parts inventory, increase operator efficiency, and have one-stop dealer service.

Caterpillar Diesels are built to deliver full power, year after year. They will not foul, even when idling, on low-cost No. 2 furnace oil. This cuts costs three ways: reduced engine maintenance, cheaper fuel, less of it.

Caterpillar horsepower ratings are factual and honest. There is a complete line of 12 Cat Diesels up to 500 HP, and Electric Sets up to 315 KW. Your dealer will show you the model that will do most for you at lowest cost.

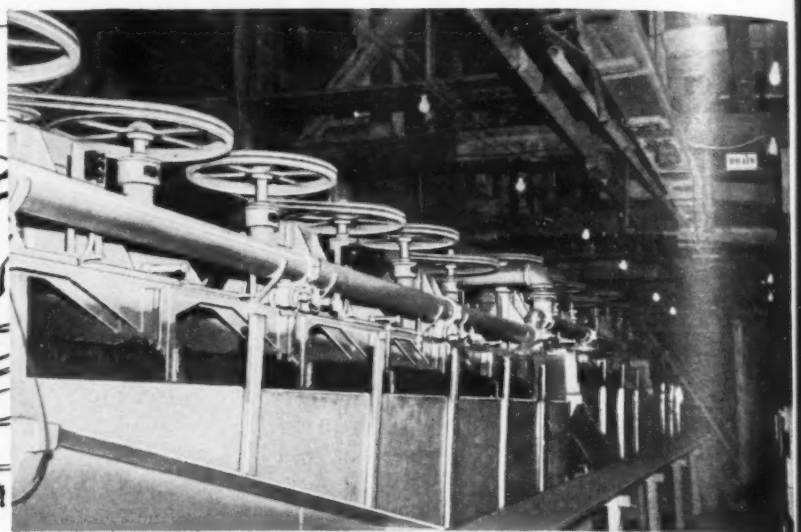
Caterpillar Tractor Co., San Leandro, Calif.; Peoria, Ill.

CATERPILLAR*

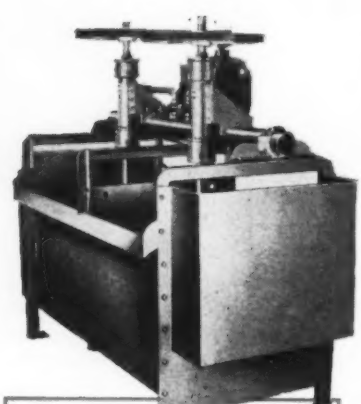
*Both Cat and Caterpillar are registered trademarks—®

**WE'VE MADE CLAIMS...
NOW MAKE US
PROVE THEM**

Victory again at... BUNKER HILL



AGITAIR® is there!



Our free Bulletin No. 4A is a graphic and comprehensive description of Agitair Flotation. Write for your copy today.

This Bunker Hill is at Kellogg, Idaho. And the tactical problem concerns successful metallurgy. It was a wise generalship that chose Agitair Machines for the rougher and cleaning circuits in the 2000-ton flotation section of Bunker Hill mill — treating zinc, lead and silver ores. For roughing, 48-inch machines are used; for cleaning, 36-inch machines.

Judged by the company it keeps, Agitair is an important factor in most of the great metal mining regions of the world. Galigher engineering service adapts this true flotation method to a wide range of metals and mill capacities. Agitair is flexible in application, rugged in use, successful in results.

Leaders in Experience & Service

HOME OFFICE
545 West 8th South
Salt Lake City, Utah
P. O. Box 209

EASTERN OFFICE
921 Bergen Avenue
Jersey City, New Jersey

Agents In All Principal Foreign Mining Districts

THE GALIGHER CO.

METALLURGICAL DIVISION · THE GALIGHER COMPANY · ENGINEERING SERVICE

CONSULTATION • ORE TESTING
PLANT DESIGN • GEOLOGIC INVESTIGATION

GRAB SAMPLES From the Mail

Not an Area of Unrest

Dear Sir:

This office has noted with concern that the April 15 issue of MINING WORLD, page 68, infers that Southern Rhodesia could be an area of potential unrest.

In a widely read publication such as MINING WORLD, and emanating from a prominent source, this misleading statement is damaging. It seems to suggest that Southern Rhodesia, because of its position between two areas in Africa which are often in the news, is also politically or racially disturbed. This is not so and the limitations on the export of chrome are solely due to lack of rail transport. Southern Rhodesia, only 63 years old, is still a very young country and transport is a major problem which is being dealt with urgently. For the 10 months from January to October 1952, the average monthly export of chrome was 24,650 short tons. New locomotives came into service towards the end of 1952, and between November 1952 and May 1953 the average export for the seven months was 37,100. Owing to competition for rail transport by tobacco exports, the potential export of chrome is likely to remain at about 35,000 tons a month until towards the end of this year (when tobacco exports cease), when it will rise to 45,000 tons a month. The target for 1954 is 50,000 tons a month.

These figures will, it is hoped, lead you to correct in print, with equal prominence, your correspondent's opinion.

Colin Black
Public Relations Officer
Office of the High Commissioner
For Southern Rhodesia
Rhodesia House
London W. C. 2, England

Egypt Iron Similar To Winn

Dear Sir:

I have read the February 1953 issue and found it most interesting and informative—especially the article about mechanization at the Winn iron mine, Scunthorpe, England. The ore body mined at that place is similar in many ways to the ore being mined here. Hence many of the problems met by the Santon Mining Company are similar to those confronting this company here in Sinai. Both my colleagues and myself have studied the article in some detail and have picked up a few useful ideas as a result of it.

S. O. Ford
Resident Geologist
Sinai Mining Company, Ltd.
Om Bogma, Egypt

Letters received to date from all over the world indicate that many other operators have "picked up" useful ideas from the article by G. V. Standerline "How English Mine Expands Output," MINING WORLD, pp. 30, 34, February, 1953.—Ed.

MINING WORLD

Including the Export Edition **WORLD MINING**

Published monthly except in April when publication is semi-monthly

VOLUME 15 **SEPTEMBER 1953** **NUMBER 10**

SAMPLE LOCATIONS

Page

WORLD MINING (OVERSEAS) SECTION

International Panorama 41
Inspiration Copper Combines Open Pit Mining and Underground Haulage 42
Tungsten's Key Miners 46
Hamme Tungsten Mine Doubles Productive Capacity
—by Howard L. Waldron 47
Japanese Toho Aen Company Enlarges Lead, Zinc, Sulphuric Acid Plant 51
Minas de Igualas 1,000 Ton-per-day Mill Treats Esmeralda Lead-Zinc Ore at Parral, Mexico
—by Robert L. Burns 52
Activities of International Mining Men 65
Free State Geduld Successfully Plugs No. 2 Shaft Bottom in South Africa to Seal Off Water 67
International News 69
Metal & Mineral Prices 95

MINING WORLD FEATURES

Drifts and Crosscuts 35
Capitol Concentrates 37
Idaho Mining Association Celebrates 50th Anniversary 57
Preliminary Program for American Mining Congress' Seattle Meeting 61
Cornucopia Oregon Gold Camp
—by Murial Sibell Wolle 63
Activities of U. S. Mining Men 63

PUBLISHING OFFICE

Emmett St. **Bristol, Conn.**

EDITORIAL AND EXECUTIVE OFFICES

121 Second St. **San Francisco 5, Calif.** **GArfield 1-5887**

General Manager, San Francisco **M. F. HOLSINGER**
Editor ..... **GEORGE O. ARGALL, JR.**
Field Editor ..... **R. L. BURNS**
News Editor ..... **J. M. TAYLOR**
Assistant News Editor ..... **M. K. SPIEGL**
Product Editor ..... **J. A. CHEESMAN**
District Manager, Chicago .... **KAREL WEGKAMP**
District Manager, New York .... **H. L. WALDRON**
Production Manager ..... **J. M. STALUN**
Assoc. Editor, Vancouver .... **CHARLES L. SHAW**

Branch Offices

New York 17 . 370 Lex. Ave., Murray Hill 3-9295
Chicago 26 . . 1791 Howard, Rogers Park 4-3420
Los Angeles 17, Calif. ..... 815 S. Witmer St.
Dunkirk 9-1112
Vancouver, B. C. . Royal Bank Bldg., MArine 7287

Published by

American Trade Journals, Inc.
Miller Freeman, President
L. K. Smith, Vice-President
W. B. Freeman, Vice-President
Miller Freeman, Jr., Sec.-Treas.

STAFF CORRESPONDENTS IN THE FOLLOWING CITIES AND MINING CENTERS:

Africa: Accra, Gold Coast; Costermansville, Belgian Congo; Johannesburg, Union of South Africa; and Kitwe, Northern Rhodesia. **Asia:** Ankara, Turkey; Benares, India; Kuala Lumpur, Federated Malay States; and Tokyo, Japan. **Europe:** Frankfurt, West Germany; Helsinki, Finland; London, England; Madrid, Spain; Paris, France; Redruth, Cornwall; Rome, Italy; Stockholm, Sweden; The Hague, Netherlands; and Trondheim, Norway. **North and Central America:** Mexico City, Mexico; San Jose, Costa Rica; and Vancouver, British Columbia. **Oceania:** Port Kembla, (N.S.W.) Australia. **South America:** Bernal, Argentina; La Paz, Bolivia; Lima, Peru; Quito, Ecuador; and Sao Paulo, Brazil.

A MILLER FREEMAN PUBLICATION

Copyright 1953 by American Trade Journals Inc.

ABC

Contents may not be reproduced without permission

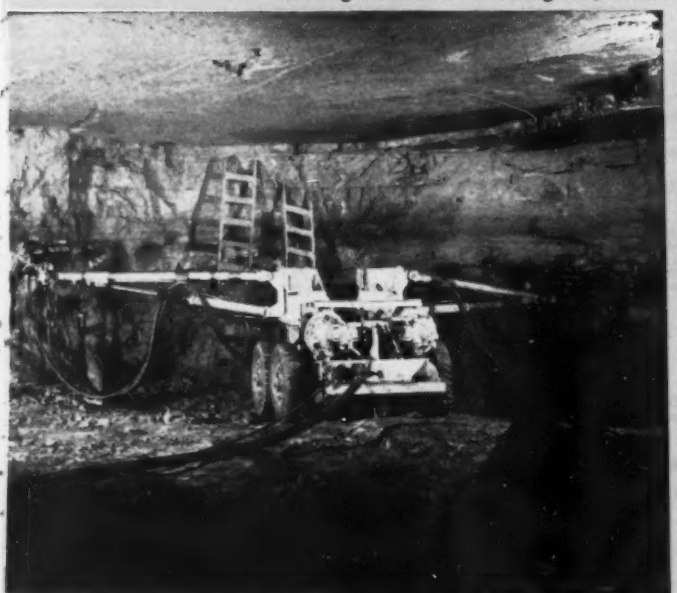
Mining World Subscription Rates

U. S. North, South and Central America	$3.00
Other Countries	$4.00
Single Copies	$ .35
Directory Number	$2.00

WORLD MINING is published the 26th of each month as a regular department of MINING WORLD and is also circulated as a separate publication on a carefully controlled free basis to a selected list of management and supervisory personnel associated with active mining enterprises throughout the world.

MINING WORLD, September, 1953. Volume 15 No. 10. Published monthly, except April when publication is semi-monthly, at Emmett St., Bristol, Conn. Executive, advertising and editorial offices, 121 Second St., San Francisco 5, California. Subscription in United States, North, Central and South America, $3.00 per year; other countries, $4.00 per year. Entered as second class matter Oct. 10, 1951 at the Post Office at Bristol, Conn., under the act of March 3, 1879. Postmaster: please send notice 3579 to MINING WORLD, 121 Second St., San Francisco 5, Calif.

DRILLING *The Drillmobile has been leveled by its three hydraulic jacks. Operator at right is drilling a hole in a burn-wedge cut, while the operator at left is drilling a top relief hole.*



SLABBING *The jibs are swung back to line the machines for drilling outside slab holes.*

IN THE ROOF *The jibs can be raised and extended to drill a horizontal hole at a height of 15 feet.*

JOY . . . Since 1851—more than 100 Years of Engineering Leadership

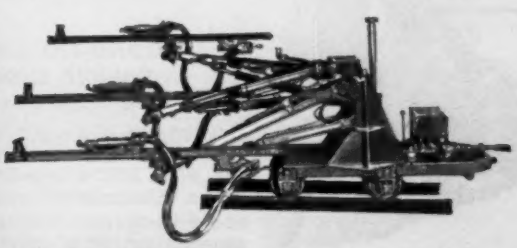
DRILLMOBILES

DO every job - SAVE everywhere!

The versatile, fast-tramming Joy DRILLMOBILE can unt one, two or three Hydro Drill Jibs. It has tractor- e steering so it can inch into shoe-tight drilling ations and worm around extremely short curves (it actually turn in its own length).

ydraulic control of the Jibs is a cinch to eliminate d labor, promote safety, and speed up drilling. Three raulic jacks keep the Drillmobile level and steady le drilling. You'll find hole positioning is easy and rate. Then, too, there's no drill misalignment with rillmobile, so steel breakage is reduced . . . *fast!* rillmobiles come in two models—one for large drifts stope work, and a "Junior" that'll do a man-sized in small-section drift work. ● For tips on how to your drilling on a paying basis, write for Bulletin 87-F. **Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.** anada: *Joy Manufacturing Company (Canada) Limited, t, Ontario.*

JOY HYDRO DRILL JIB *Air hydraulic control of all jib movements eliminates heavy lifting and permits more accurate hole spotting for more efficient use of powder and controlled breakage.*



JOY TRIPLE JIB JUMBO *Track-mounted unit similar in many ways to the Drillmobile. Booms are quickly raised or lowered to any position. Truck is held rigid and solid by a 20-ton hydraulic jack.*

ING *The Drillmobile travels its own power. It can be easily rted to free wheeling for towing.*

Consult a Joy Engineer

JOY

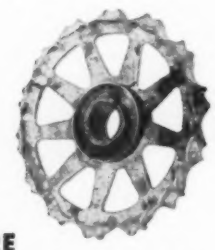
WORLD'S LARGEST MANUFACTURER OF UNDERGROUND MINING EQUIPMENT

W&D M4392

Pacific Replacement Parts are interchangeable with original factory parts. Made of manganese steel or heat-treated alloy steel. Heavily reinforced – users report three- to four-times longer life. Customers served as long as 30 years keep repeating – that's proof of dependability.

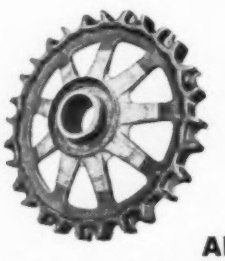
PACIFIC RENEWABLE SPROCKET RIMS

When sprocket rims wear out, don't throw away valuable spokes and hubs. Simply weld on new Pacific Manganese Steel Sprocket Rims and be dollars ahead. Idler wheel rims, too. Any welder can do the job. Send for Bulletin 217.



BEFORE

Don't throw away hubs and spokes because sprocket rims are worn like this.

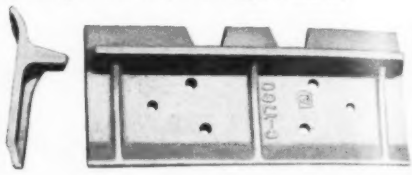


AFTER

Weld on new Pacific Manganese Steel Sprocket Rims and be dollars ahead.

TRACTOR GROUSER SHOES

Users report they last three- to four-times longer, thanks to reinforced design and superior, heat-treated alloy steel. Available for most leading makes of crawler type tractors.



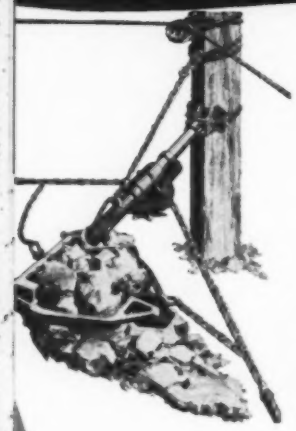
OTHER PACIFIC REPLACEMENT PARTS

Dozer Corners, Street Pads, Shovel Track Shoes, Crusher Jaws, Mantels and Concaves – Many Others.

Dependable Performers ABOVE GROUND

PACIFIC PRODUCTS

Dependable Performers UNDERGROUND



Pacific Mining Products are used around the world. Designed by mining men who know underground operations. Their superiority is maintained by constant study of the equipment at work plus rigid quality control of production of tough, wear-resistant alloy steel components.

"ROUND-THE-CORNER" SHEAVE BLOCKS

(U.S.A. and Foreign Patents Applied For)

Cut the cost of many mucking operations in half. Eliminates double-slushing. With RTC a two-drum hoist can pull a "Slushmaster" around any turn above 90-degrees. For action pictures showing method of operation, send for Bulletin No. 232.

PACIFIC "SLUSHMASTER"

(U.S.A. and Foreign Patents Applied For)

They dig in, secure a full load in a single pass and then carry it with less horsepower. Ride on runners on backhaul. Easy disassembly. Nine models from 26" to 60" widths – capacities from 8 to 51 cu. ft. Write for Bulletin No. 215.

PACIFIC SHEAVE BLOCKS

Simple – Rugged – Durable. Complete line with models to suit every cable size, every operating requirement. Manganese steel wheels and side frames. Roller bearings. Available with hook, shackle and safety swivel shackle suspensions. Send for Bulletin No. 238.

OTHER PACIFIC MINING PRODUCTS

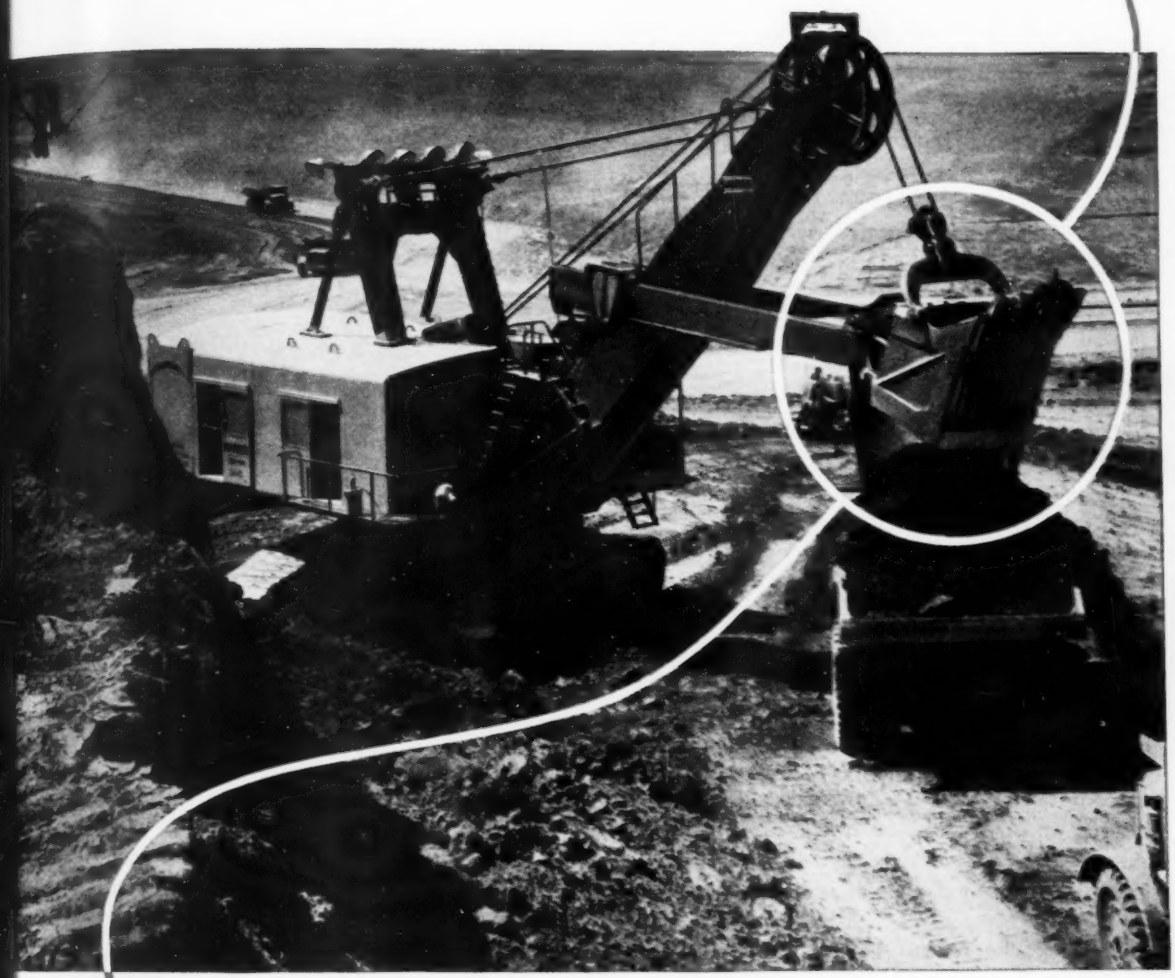
Jaw Crushers, Sizes: 6" x 12" to 10" x 30", Manganese Steel Crusher Jaws, Sheave Anchors, Bit Knockers.

ALLOY STEEL & METALS CO.

1848 EAST 55TH STREET, LOS ANGELES 58, CALIFORNIA

Mailing Address: BOX 15323 VERNON STATION, LOS ANGELES 58, CALIFORNIA

IN BIG YARDAGE YOU CAN'T AFFORD TO BE WITHOUT



THE MARION 191-M

World's Largest Shovel on Two Crawlers
10 Cubic Yards
with small machine cycle speed and maneuverability
Ward-Leonard Electric or Diesel Electric

MARION ESPECIALLY INVITES YOU to attend the Metal Mining Convention in Seattle this month—we want to tell you about production records the new MARION 191-M is setting in copper and iron.

MARION
Power Shovel Co.
Marion, Ohio, U.S.A.
Offices and warehouses in all principal cities

Tournarocker hauls heaped load along narrow dike top. Note network of dikes and pumped-out areas behind the machine. Normally, off-shore ore deposits like these are excavated underwater by floating dredges. These cannot be used at Bangka because of the great number of huge boulders located on the sea bed.

Indonesia moves ocean to mine tin

ABOUT 300 miles southeast of Singapore, off the Indonesian island of Bangka, lies a network of dikes similar to those in the Netherlands. The purpose of the Indonesian dikes is far different, however, from those in Europe. In the Pacific, dikes are built of sand, stabilized by a mat of thick vines. They form a honeycomb of coffer-dams which enclose large areas of shallow sea water. The water is pumped out, uncovering the sea bottom with its rich tin deposits for mining by conventional dry-land methods. The mining is comparatively easy; the complicated part is constructing the dikes. All material must be hauled along tops of existing dikes, which are so narrow and uneven, that a vehicle is often in danger of skidding into the sea.

Tournarockers haul 11,100 yds. monthly

Mine officials first tried ordinary trucks to do this hauling. They proved unsuitable. They could not turn on the narrow dike tops and their small tires could not develop enough traction for safety. Then, three 9-ton D Tournarockers were brought in. Their electric controls, positive power-steer, big low-pressure tires, and 4-wheel air brakes gave operators perfect safety on the slippery narrow dikes. Shovel-loaded, these LeTourneau rear-dump units carried 7 cu. yd. of sand per trip. They hauled rapidly, and turned easily within a radius of 12.3 ft. When haul was 1½ miles one-way, they moved 11,100 yds. of sand per month. All 3 Tournarockers worked to great satisfaction despite the difficult job conditions and corrosive sea salt.

Order 16 more units

Because of this dependability and the Tournarockers' fast, steady production, the management of the Bangka Tin Mines was able to complete the dikes before the monsoon season began. They also have ordered 16 additional 9 and 18-ton Tournarockers for use in open-pit tin mining.

If you too have problems in speeding up on your earthmoving — or in hauling over rough narrow roads — or in reducing maintenance costs, it will pay you to investigate Tournarockers. There is a size to fit your needs — 9, 18, 35, and 50 tons. They are an even better investment for you since the earthmoving experience of LeTourneau has been combined with the precision manufacturing traditions of Westinghouse Air Brake.

Tournarocker—Trademark Reg. U. S. Pat. Off.

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

The instant operator pushes switch, bowl raises and dumps load. Bowl is lowered when switch is again pushed. Entire process is controlled electrically through cables.

GREATER OUTPUT AT LOWER COST

with LIMA type 1201

3 or 3½ yd. capacity

If you are faced with the problem of maintaining profits despite continually rising labor and other costs, you will find a solution in the LIMA Type 1201 shovel, crane and dragline. Here is a machine capable of *peak production* day after day with greater efficiency, fewer delays and less operator fatigue. LIMA shovels, cranes and draglines are especially designed and built for the jobs requiring high output at low cost.

A LIMA representative will gladly show you how a LIMA Type 1201 *can cut costs on your operations. The LIMA line includes shovels ¾ to* 6 *yards, cranes to* 110 *tons, and draglines variable.*

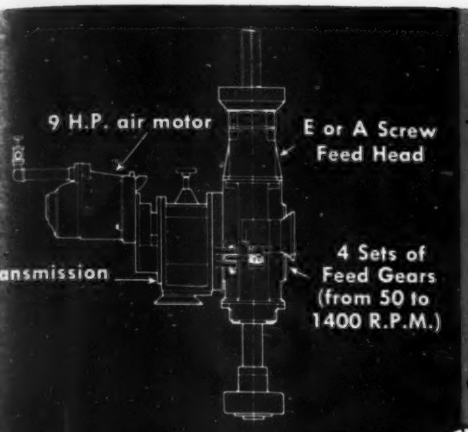
CABLE ADDRESS: LIMASHOVEL

LIMA

SHOVELS • CRANES
DRAGLINES • PULLSHOVELS

BALDWIN BLH LIMA-HAMILTON
Construction Equipment Division

BALDWIN-LIMA-HAMILTON CORPORATION
Construction Equipment Division
LIMA, OHIO, U.S.A.



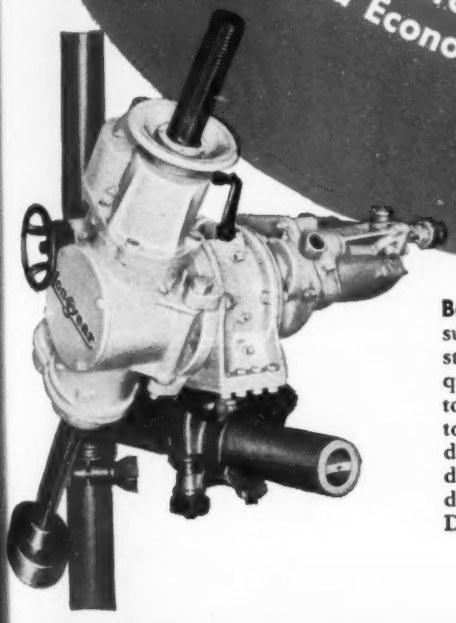
Longyear

PROSPECTOR HI-SPEED AIR DRILL

The ideal light weight drill for easy use in limited working areas . . .

. . . for holes up to 500′ in depth.

The Choice of Drill Operators for Dependability and Economy.



Because of its small size, the Longyear Prospector Air Drill assures successful drilling in spaces of small dimension—in drifts, raises and stopes. Because of its light weight, the *Prospector Hi-Speed* may be quickly set up, with drilling started the moment the motor is connected to the air hose. The duplex air motor transmits a steady flow of power to the drilling bit thereby cutting bit costs and reducing bit wear. This drill has a versatility of uses which include short hole prospecting; drilling blast holes rapidly at low cost; drilling holes for ventilation, drainage or electrical cables; and for grout hole drilling. Prospector Drills are also available in electric and gasoline driven models.

Write today and let us send you full details and specifications.

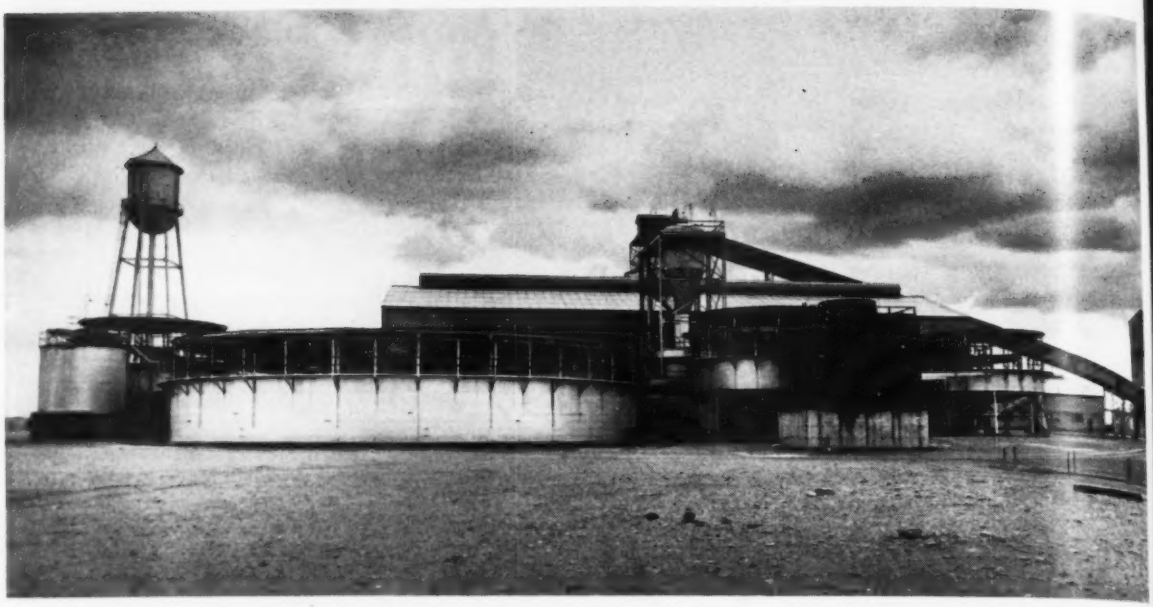
In U.S.A.
E. J. LONGYEAR COMPANY
Minneapolis 2, Minn.

Longyear

In Canada
CANADIAN LONGYEAR LTD.
North Bay, Ontario

DIAMOND CORE DRILLS • CONTRACT CORE DRILLING
SHAFT SINKING • GEOLOGICAL INVESTIGATIONS

REPRESENTATIVES IN PRINCIPAL MINING CENTERS IN THE UNITED STATES AND OTHER COUNTRIES



Overall view of the plant with a 120′ dia. Dorr Thickener in the left foreground handling flotation tailings. A 40′ dia. Dorr effluent Thickener and 40′ dia. Dorr Hydroseparator are at the right. All three units are covered to prevent temperature increases resulting from the sun's rays.

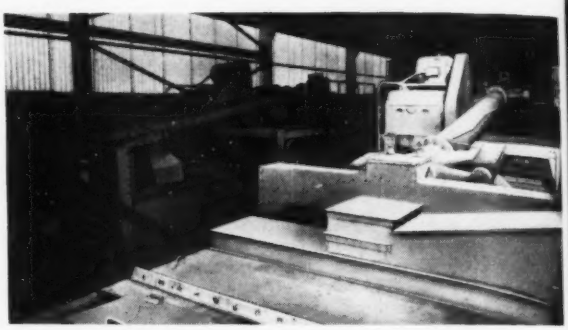
NEW MEXICO POTASH PRODUCER

Combines Chemical and Metallurgical Techniques at New Plant . . .

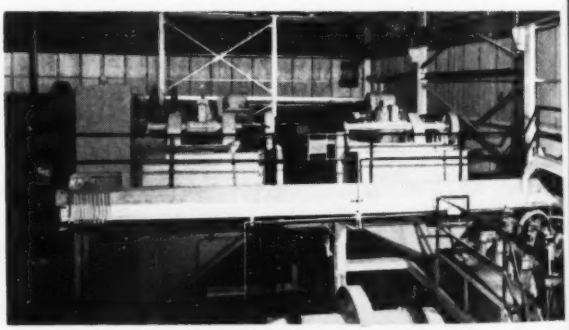
A new U. S. producer for the quality potash market, Duval Sulphur & Potash Company recently started up this modern plant near Carlsbad, New Mexico. A perfect example of the growing convergence of chemical and metallurgical techniques, the plant makes skillful use of the latest developments in both fields.

The flowsheet includes crushing, grinding, classification, hydroseparation, flotation, thickening, centrifuging, crystallization and drying.

At Duval, as throughout the chemical and metallurgical industries, Dorr equipment and techniques play a vital part in wet processing flowsheets. For more information on the scope of the Dorr technical service, write for bulletin No. 7002. The Dorr Company, Stamford, Conn. *In Canada:* 26 St. Clair Avenue, E., Toronto 5.



Closeup of two Duplex Dorr HX Classifiers. The Primary at right handles raw crushed salt which has been pulped with return brine. Sands go to a rod mill and fines to the Hydroseparator.



General view of the milling section. Rod mill discharge goes to the Secondary Classifier at the right. Sands are discharged to conditioners and fines overflow to the Hydroseparator.

Better tools TODAY to meet tomorrow's demand

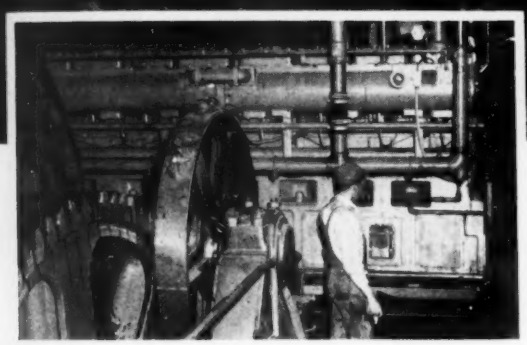
DORR

WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT

THE DORR COMPANY • ENGINEERS • STAMFORD, CONN.

Offices, Associated Companies or Representatives in principal cities of the world.

Another Example of Efficient Power at Lower Cost



By far the largest dragline in Alabama . . . a new 1,285,000-pound Bucyrus-Erie unit, powered by a modern 850-hp Cooper-Bessemer diesel. Owned and operated by the DeBardeleben Coal Corp., the unit strips overburden and is a key factor in increasing this company's coal production 10,000 tons a month while reducing mining costs.

How a big "DRAG" minimizes power costs

By far the largest dragline ever used in Alabama, the new "H. T. DeBardeleben" (shown here), is now stripping rock, sand and shale at a rate of 600 cubic yards an hour in double truckload bites. And like so many big draglines everywhere, it has the money-saving advantage of a husky, smooth-running, long-lived Cooper-Bessemer.

But check up on *all* the factors that determine the efficiency, behavior and cost of power. You'll come up with the reasons why Cooper-Bessemers are favored engines in this and all other kinds of heavy-duty service.

There's a Cooper-Bessemer diesel, gas engine or gas-diesel for every power need from 200 to 3700 bhp. Our nearest office will gladly give you specific information.

MOUNT VERNON, OHIO

COOPER-BESSEMER

GROVE CITY, PENNA.

New York Washington, D.C. Bradford, Pa. San Francisco Houston, Dallas, Greggton, Pampa and Odessa, Texas Seattle Shreveport St Louis Los Angeles Chicago Cooper-Bessemer of Canada, Ltd., Halifax, Nova Scotia Tulsa Gloucester, Mass. New Orleans, La.

Design Features

1 End-seating valve is fast and positive in action. It meters the air efficiently — keeps air consumption down, provides powerful force of blow and strong rotation. Performance of valve is not affected by wear.

2 Positive lubrication system distributes oil throughout the machine and insures long life for all moving parts. Rifle bar is oiled at every stroke of piston. This prolongs the life of rifle nut and rifle bar at least 50%.

3 All Le Roi-CLEVELAND Sinkers are famous for strong, positive rotation. That's why they are at their best when the drilling's the toughest. Properly designed rotation parts—ratchet, pawls, rifle bar and rifle nut—plus efficient lubrication of these parts, give you this important drilling advantage.

4 Exhaust ports are large — they avoid freezing.

5 Plenty of hole-cleaning power is provided in all Le Roi-CLEVELAND Sinkers, so that you can get the most out of their powerful force of blow and strong rotation. Bit wear is reduced and drilling speeds are faster.

6 Floating-type chuck permits slight misalignment without binding piston. This reduces piston scoring, adds to life of the machine.

7 Throttle valve is designed to stay in any desired operating position from full-on to blowing. All parts are fully enclosed, protected from dirt, and generously lubricated.

...here's the "inside story"

of why Le Roi-CLEVELAND Sinkers drill more footage per shift, stay underground longer

THERE are things you *can't see*, behind Le Roi-CLEVELAND dependability—"hidden values," design details. But you know *they're there*—because that's why Le Roi-CLEVELAND Sinkers drill more feet of hole per shift . . . why they run at peak efficiency day in and day out . . . why they lower drilling costs on any job that requires a hand-held drill.

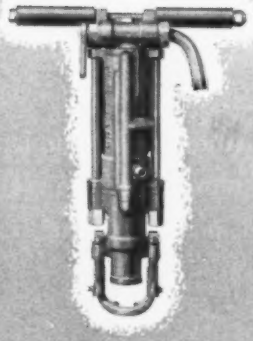
It's Le Roi-CLEVELAND *engineering* that gives you performance advantages that really pay off for you: Low air consumption. Easy handling. Strong rotation. High drilling speed.

Le Roi-CLEVELAND has a complete line of sinkers from 18 to 80 lbs. Your Le Roi representative can show you why you're money ahead with any one of them. See him soon.

Write for free Bulletin No. RD25.

CLEVELAND ROCK DRILL DIVISION
Le Roi Company
A Subsidiary of Westinghouse Air Brake Co.
12500 BEREA ROAD • CLEVELAND 11, OHIO
Plants: Milwaukee, Cleveland and Greenwich, Ohio

83-pound sinker
wet types. 1" x 4 1/4" quarter-octagon. 1 1/4" lug shank. Designed for sinking in hard rod, faulting ground general drilling with steel in hard rock.



H10 — 45-pound sinker
Dry, constant blowing, and wet types. 7/8" x 3 1/4" and 1" x 4 1/4" hex or quarter-octagon chucks. Wet automatic dust-control back-head, if desired.

H166 — 33-pound sinker
Wet and dry types. 7/8" x 3 1/4" chuck. Recommended for hard coal. Also ideal for wet or dry drilling in shale, limestone, sandstone, etc.

H22 — 18-pound sinker
Wet and dry types. 7/8" x 3 1/4" chuck. Recommended for: Drilling holes for trolley hanger bolts. Cleaning up roof. Clearing out rock falls. Brushing bottom. Drilling oversize pieces of grizzley. Cutting hitches.

H111 — 55-pound sinker
Dry, constant blowing, and wet types. 1" x 4 1/4" chuck (7/8" x 3 1/4" and popular sizes of quarter-octagon and lugged steel chucks also available.) Wet automatic dust-control back-head, if desired. Primarily designed for hard rock, but equally efficient in soft and medium formations.

. Air-feed mountings up to 10' steel changes.

control
impact and
abrasion
with

AMSCO AW-79

FOR AUTOMATIC HARDFACING

A new chrome-moly electrode for submerged arc welding equipment

Excellent for rebuilding and hardfacing tractor rollers and idlers, back-up rolls, crusher rolls, steel wheels, sheeting rolls, as well as dozens of other applications. For complete metallurgical information and technical data, write Amsco, Chicago Heights, Illinois.

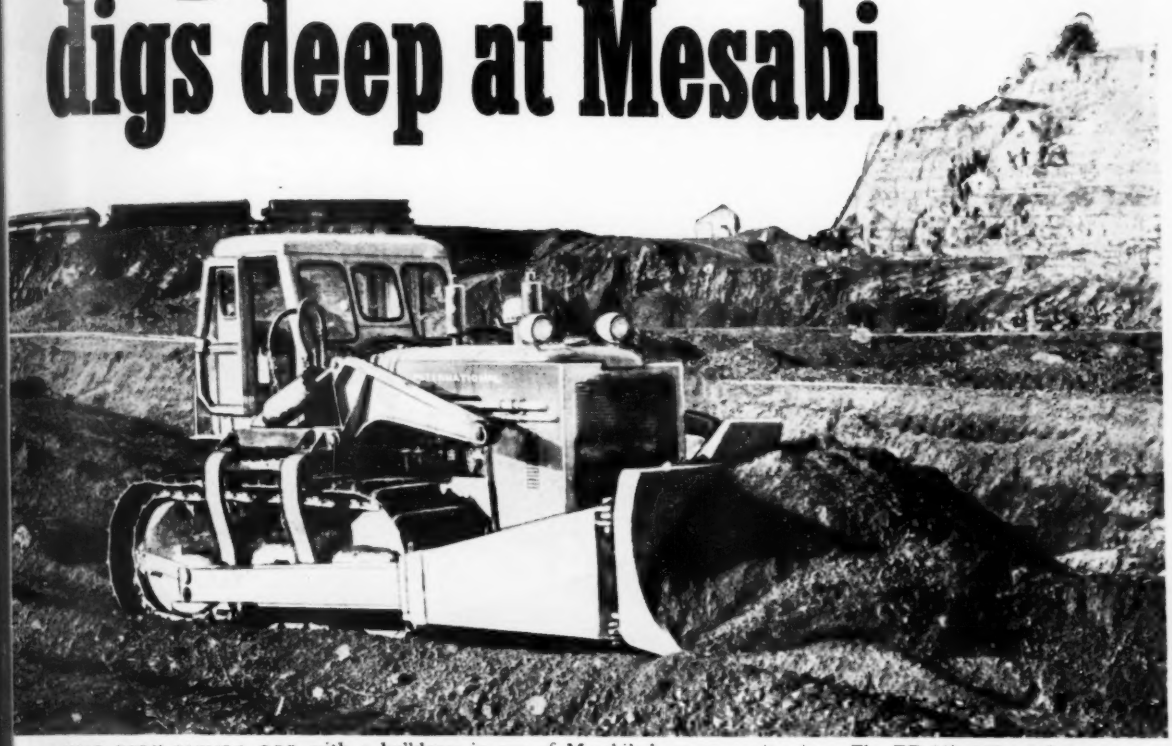
AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION

425 East 14th Street · Chicago Heights, Ill.

OTHER PLANTS: NEW CASTLE, DEL., DENVER, OAKLAND, CAL., LOS ANGELES, ST. LOUIS. IN CANADA: JOLIETTE STEEL DIVISION, JOLIETTE, QUE. AMSCO WELDING PRODUCTS DISTRIBUTED IN CANADA BY CANADIAN LIQUID AIR CO., LTD.

"Big Red" TD 24 digs deep at Mesabi



"BIG RED" BLENDS ORE with a bulldozer in one of Mesabi's huge open pit mines. The TD-24's 148 maximum drawbar horsepower makes this hard job easy. So do its pivot-turns, feather-turns, turns with power on both tracks; its 8 speeds forward, and 8 reverse; its instant, all-weather, push-button starting—plenty important when the temperature drops! These advantages make the TD-24 the Champ for sure!

International TD-24 helps keep production high

One reason the great Mesabi iron range keeps right on supplying the bulk of the nation's ore—in spite of dire warnings by mining alarmists over the past twenty years—is the growing use of bigger, better machines to keep costs down even though today's ores are lower quality and harder to get.

For example, big red International TD-24 crawler tractors—the fastest and most powerful crawlers on the market—master many tough Mesabi jobs:

They strip off ever-deeper layers of overburden.

They constantly build new mine roads in Mesabi's great open pits—build them faster and easier than ever before.

They relocate railroad roadbeds the same way—again deep in the pits themselves.

They bulldoze together high-grade and low-grade ores, make usable blends to ship to the steel mills.

As a result of such ingenious and increasing use of modern machines, six tons of material is removed per man-hour today, where less than four tons were removed per man-hour in 1931.

For details on the great TD-24, see your International Industrial Distributor. You'll be a TD-24 man yourself from then on in!

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILL.

INTERNATIONAL POWER THAT PAYS

One hose handles them all!

VERSICON, Thermoid's versatile, all-purpose hose, handles virtually any type of gas or liquid . . . makes stocks of many different types of hose unnecessary. You save through reduced inventories, simplified buying and less storage space. Losses from end remnants are greatly reduced.

VERSICON Hose is built to last. Synthetic oil-proof tube is reinforced with braided, high-tensile rayon. Tough oil-proof cover resists weather and abrasion.

For quick, easy identification, VERSICON has a brown cover. It's available in sizes from $\frac{3}{16}$" to $1\frac{1}{2}$" in lengths to fit your requirements.

In addition to various kinds of multi-purpose hose, Thermoid makes hose for certain specific applications, such as paint spray, suction, creamery, etc. Call your Thermoid Distributor. He can supply you with the Thermoid Hose best suited for your requirements. Or write direct for Catalog No. 3680.

Thermoid Western Co.

Conveyor & Elevator Belting • Transmission Belting • F.H.P. & Multiple V-Belts
Wrapped & Molded Hose • Rubber Sheet Packings • Molded Products
Industrial Brake Linings and Friction Materials

Offices and Factories: Trenton, N.J. Nephi, Utah

STANDARD ENGINEER'S REPORT

DATA

LUBRICANT Calol Red Engine Oils

UNITS Bearings — Crushers and ball mills

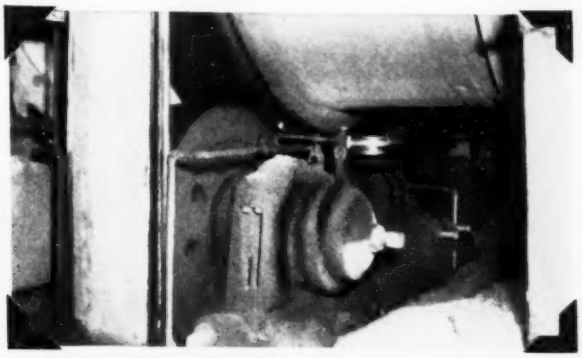
LUBRICATORS Circulating & Drip feed

CONDITIONS Extreme shock loads

LOCATION Arizona

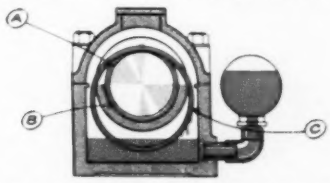
Stable oil cuts deposits in ore-crusher bearings!

CALOL RED ENGINE OILS in these ore-crusher and ball-mill bearings provide good lubrication and hold deposits to the minimum, although loads are tremendous and oil temperatures have gone as high as 155°F. They are used throughout the big Arizona plant—which handles more than 25,000 tons of ore per day—where these pictures were taken. Using as much as 40,000 gallons of Calol Red Engine Oils in a year, the plant operators have found them to be uniform and satisfactory over many years. Specially refined to provide adequate, economical lubrication under tough conditions, Calol Red Engine Oils will reduce wear and save maintenance costs in your mill or other industrial operation. These stable mineral oils come in different grades to meet varying conditions and wide range of operations.



FOUR BEARINGS in trunnion wheels, like this, support about 100 tons when ball mills are charged with ore. Calol Red Engine Oil is applied to the 8½"x16" journals by drip-feed, as shown. Circulated through lines, it is filtered and re-used.

How CALOL Red Engine Oils cut industrial lubrication costs



A. Solvent-refined selected mineral oils. Exceptional stability prevents formation of deposits and assures lubrication.

B. Have low carbon residue and pour tests —provide wide range of application in external lubrication of general industrial machinery.

C. Pick up well on ring oilers, may be applied by all types of oiling systems.

FREE CATALOG: "How to Save Money on Equipment Operation," a booklet full of valuable information, will be sent you on request to Standard Oil Company of California, 225 Bush St., San Francisco, Calif.

CALOL

FOR MORE INFORMATION about this or other petroleum products of any kind, or the name of your nearest distributor handling them, write or call any of the companies listed below.

STANDARD OIL COMPANY OF CALIFORNIA
225 Bush Street • San Francisco 20, California

THE CALIFORNIA COMPANY
P. O. Box 780 • Denver 1, Colorado

STANDARD OIL COMPANY OF TEXAS
P. O. Box 862 • El Paso, Texas

ANNOUNCING
THE DU PONT VOLTOHMETER

. . . a triple-purpose precision instrument for testing electric blasting operations

The Du Pont Voltohmeter is an entirely new, all-purpose precision instrument designed for testing in connection with electric blasting. It combines the functions of Du Pont Blasting Galvanometers, and Detect-A-Meters, and offers many other advantages.

1. **As a blasting galvanometer,** the Voltohmeter may be used to measure resistance of electric blasting caps, blasting circuits and firing circuits accurately. One dial setting has a range of 0 to 100 ohms, and another, from 0 to 1000. The scale is graduated for easier, more accurate reading, and a convenient zero-mark adjustment is provided.

2. **As a stray-current detector,** the Voltohmeter offers greater flexibility in detecting, tracing and identifying both AC and DC voltages. Separate scales are provided reading from 0-1.5 volts DC, 0-1.5 volts AC, 0-30 volts DC and AC and 0-600 volts DC and AC.

3. **As a voltmeter,** the new Voltohmeter may be used for testing all power-line voltages commonly used in electric blasting operations, up to 600 volts . . . both AC and DC.

Each Voltohmeter is in a sturdy leather carrying case with shoulder strap and pocket containing two plastic insulated probe wires with insulated alligator clips shown below. An instruction plate and pamphlet are also included. Compact, it measures only 6⅝ x 3⅞ x 4½ inches; weighs only 2½ pounds.

Ask the Du Pont Explosives representative in your district for complete information about this new, highly efficient, triple-purpose instrument for promoting safer blasting. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.

DU PONT EXPLOSIVES

Blasting Supplies and Accessories

DU PONT

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

GM DIESEL
CASE HISTORY NO. 1A3-12

OWNER: Georgia Coating Clay Co., Macon, Ga.

INSTALLATION: Twelve GM Diesels power shovels, Koehring Dumptors, GMC Trucks stripping 97 feet of overburden and mining Kaolin.

PERFORMANCE: Equip. Supt. W. J. Herrington reports 6-71 powering Koehring 1½-yd. shovel (background) has worked 45 hours a week, 52 weeks a year for over 6 years--about 14,000 hours--without an overhaul. Newer ¾-yd. Lima (foreground), powered by a 3-71, has already operated for 3500 trouble-free hours.

It pays to STANDARDIZE on

GM
GENERAL MOTORS
DIESEL POWER

14,000 HOURS
WITHOUT ENGINE OVERHAUL

Long engine life between overhauls is only one advantage you get with General Motors Diesel engines. Power on every piston downstroke makes a 2-cycle GM Diesel accelerate faster under load—gets more work done every hour. Simple, practical design cuts down time because it does away with such trouble sources as high pressure fuel lines. When service is needed, you'll find the cost surprisingly low. GM Diesel engines are easy to work on—simple to inspect and service. And comparison will show you that GM Diesel parts cost less.

You can get GM Diesel power in leading makes of shovels, tractors, hauling units, loaders, compressors and generators. A postcard will bring you a list of the 750 different models of equipment powered by General Motors Diesel engines.

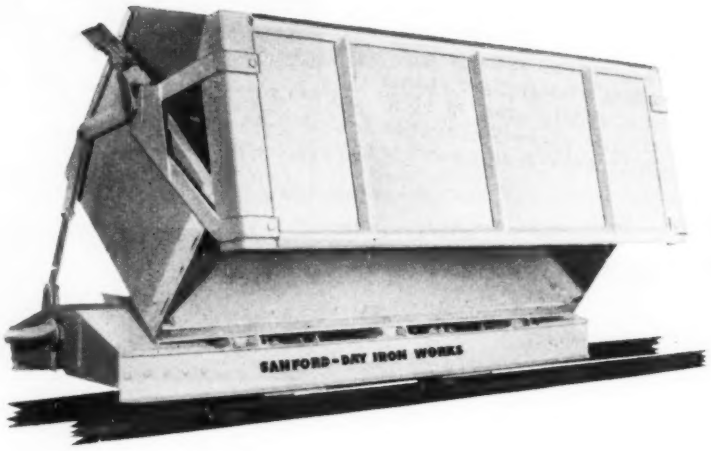
DETROIT DIESEL ENGINE DIVISION

GENERAL MOTORS • DETROIT 28, MICHIGAN

Single Engines . . . 16 to 275 H.P. Multiple Units . . . Up to 840 H.P.

NEW MINE CARS BUILT BY SANFORD-DAY FOR METAL AND NON-METALLIC MINING

This is one of the S-D Automatic Drop Bottom Cars to be installed by Certain-Teed Products Corp. for hauling gypsum. Extra heavy steel plates were used in the construction of this car to absorb shock loads. It is another Sanford-Day development toward extending the life of cars in tough service, to increase haulage efficiency and reduce maintenance costs.



In many mines the Granby Side Dump Car is the required method of haulage. Here is a Sanford-Day built Granby Car, designed for practical construction, with re-inforcing angles and extra supporting members where needed to increase the life and service of the car. This car was built for the LePanto Consolidated Mining Co., Philippine Islands.

Regardless of Your Car Requirement, We Build it!

We show you these two Sanford-Day Mine Cars, just recently completed, because they are examples of Sanford-Day's experience and know-how in practical car design and dependable construction. These cars will also give you an idea of why so many metal and non-metallic mine operators are turning to Sanford-Day for their mine car requirements.

These operators, like yourself, are cost-minded! They know that skimpy fabrication is false economy. Consequently, they are installing Sanford-Day Cars because of their superior construction . . . extra welding . . . extra rivets and extra reinforcing where extra strength should be—cars designed and built up to service requirements for longer life and less maintenance.

Regardless of the type car you need, we build it . . . and you'll discover that an investment in Sanford-Day built cars will be money well spent.

SANFORD-DAY Iron Works

KNOXVILLE, TENNESSEE

LET REPUBLIC SUPPLY YOUR INDUSTRIAL NEEDS!

Complete stocks of top quality Goodyear hose and belting plus friendly, helpful assistance from men who know your problems is the basis of Republic Supply's operation. Belt splicing is done by real experts. Any hose couplings you order will be installed to your specifications without charge.

The moral: Let REPUBLIC SUPPLY your industrial needs!
Next time—anytime—call Republic Supply.

* * * *

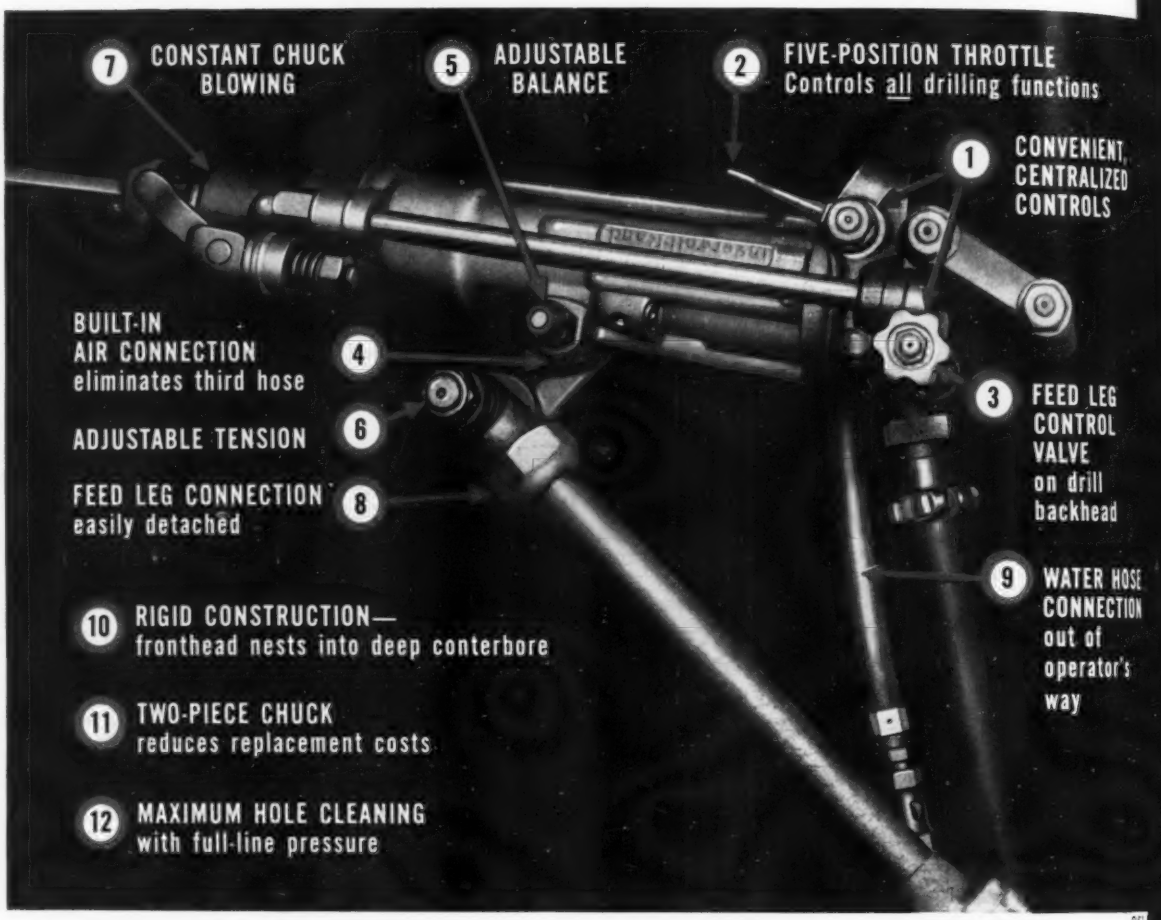
THE REPUBLIC SUPPLY COMPANY

REPUBLIC RS SUPPLY CO

Los Angeles Office — phone: UNderhill 0-2511; San Leandro — phone: LOckhaven 2-0414; Phoenix — phone: ALpine 4-3434
Pipe, valves and fittings • abrasives • shop supplies and tools • rigging materials • mechanical rubber goods • machinery • oil field supplies

An independently owned and operated company serving Western industry

JACKDRILL FEATURES
that add up to
MORE TONNAGE PER SHIFT!


7 CONSTANT CHUCK BLOWING
5 ADJUSTABLE BALANCE
2 FIVE-POSITION THROTTLE Controls all drilling functions
1 CONVENIENT, CENTRALIZED CONTROLS
BUILT-IN AIR CONNECTION eliminates third hose
4
ADJUSTABLE TENSION
6
FEED LEG CONNECTION easily detached
8
3 FEED LEG CONTROL VALVE on drill backhead
9 WATER HOSE CONNECTION out of operator's way
10 RIGID CONSTRUCTION— fronthead nests into deep conterbore
11 TWO-PIECE CHUCK reduces replacement costs
12 MAXIMUM HOLE CLEANING with full-line pressure

The advantages of a Jackleg type of drill are now so well established that you should buy the best available design for the job. Collectively the Ingersoll-Rand JR-38 Jackdrill design features make it the fastest drilling, easiest handling one-man drifter unit ever developed.

The JR-38 is not a Jackhamer-Jackleg combination but a completely integrated Jackleg Drill—designed to take full advantage of faster, easier-drilling Carset Jackbits. Use it as a drifter—as a stoper—as a Jackhamer. Its flexibility, ease of handling and simplicity of control pleases owners and operators alike.

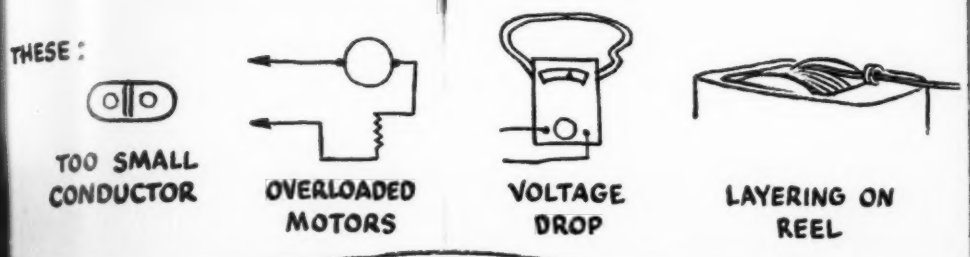
Ask your Ingersoll-Rand representative for complete information on the new JR-38. Or write for your copy of Bulletin 4144.

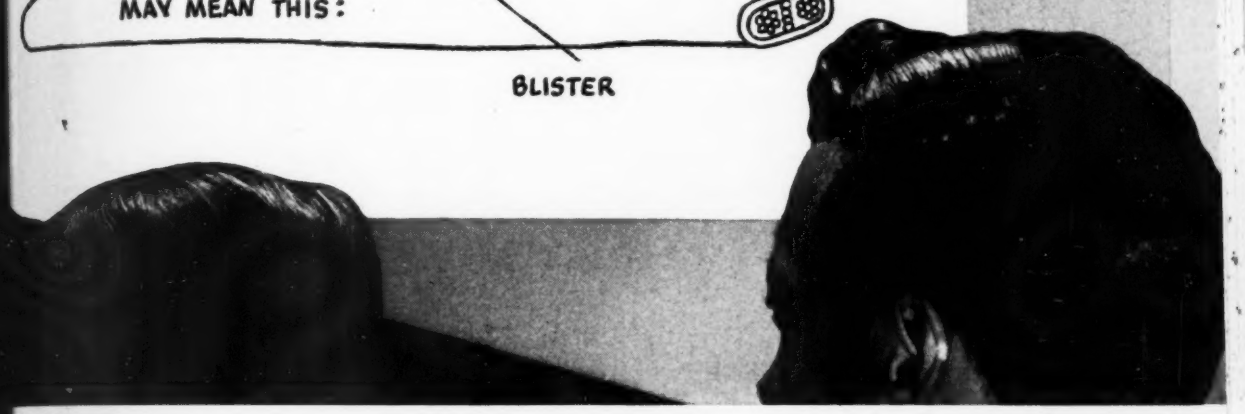
Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N. Y.

COMPRESSORS • AIR TOOLS • ROCK DRILLS • TURBO BLOWERS • CONDENSERS • CENTRIFUGAL PUMPS • DIESEL AND GAS ENGINE

HOW TO SPOT DAMAGE FROM CURRENT OVERLOAD . . .





. . . AND WHY THERE'S GREATER HEAT STAMINA IN ANACONDA'S NEW MINING MACHINE CABLE

sters, formed by gases from overheated stallation, are a sure sign of cable over- ding. A torn cable may result. Since u can't always control overloads, it's portant to choose *quality* cable.

Today, due to better design, jackets and ulation, good cables shouldn't cook the reel the way they used to. But is only makes overloads harder to de- t. They still may be present . . . caused too small a conductor, overloaded ma- ines, voltage drop or even layering of e cable. With 4 layers on the reel, ac- rding to I.P.C.E.A., unventilated bot- m layers lose 65% of capacity.

WHY THE NEW ANACONDA CABLES ARE SAFER

First, they are more flame-resistant. Jacket is made from a new neoprene formula. Improved cold-rubber insulation gives greater heat stamina. Patented breaker strip* insures a safer ground. No ANACONDA Cable has ever failed a U. S. Bureau of Mines flame-test!

CABLE LIFE NOW MUCH LONGER

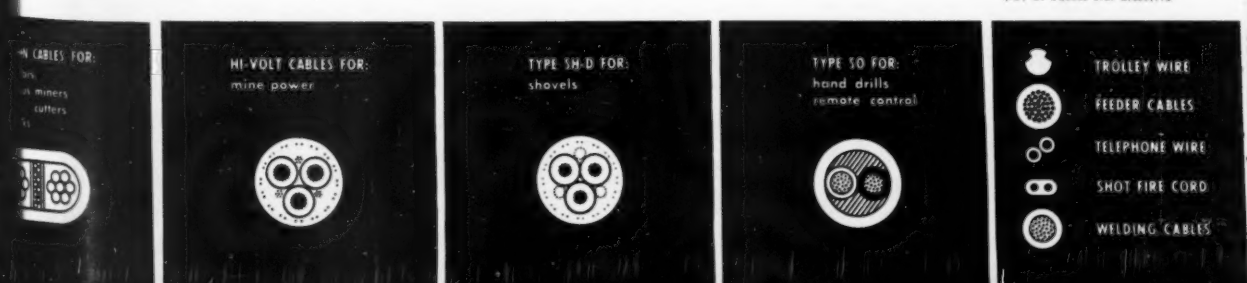
In 15 mines recently surveyed, ANACONDA Cables on shuttle cars are lasting up to 300% longer than cables made only a few years ago. Together, jacket and insulation protect these cables better—especially in wet mines where sliver-cuts can cause shocks. The cables are tougher. New-type stranding flexes better under tension.

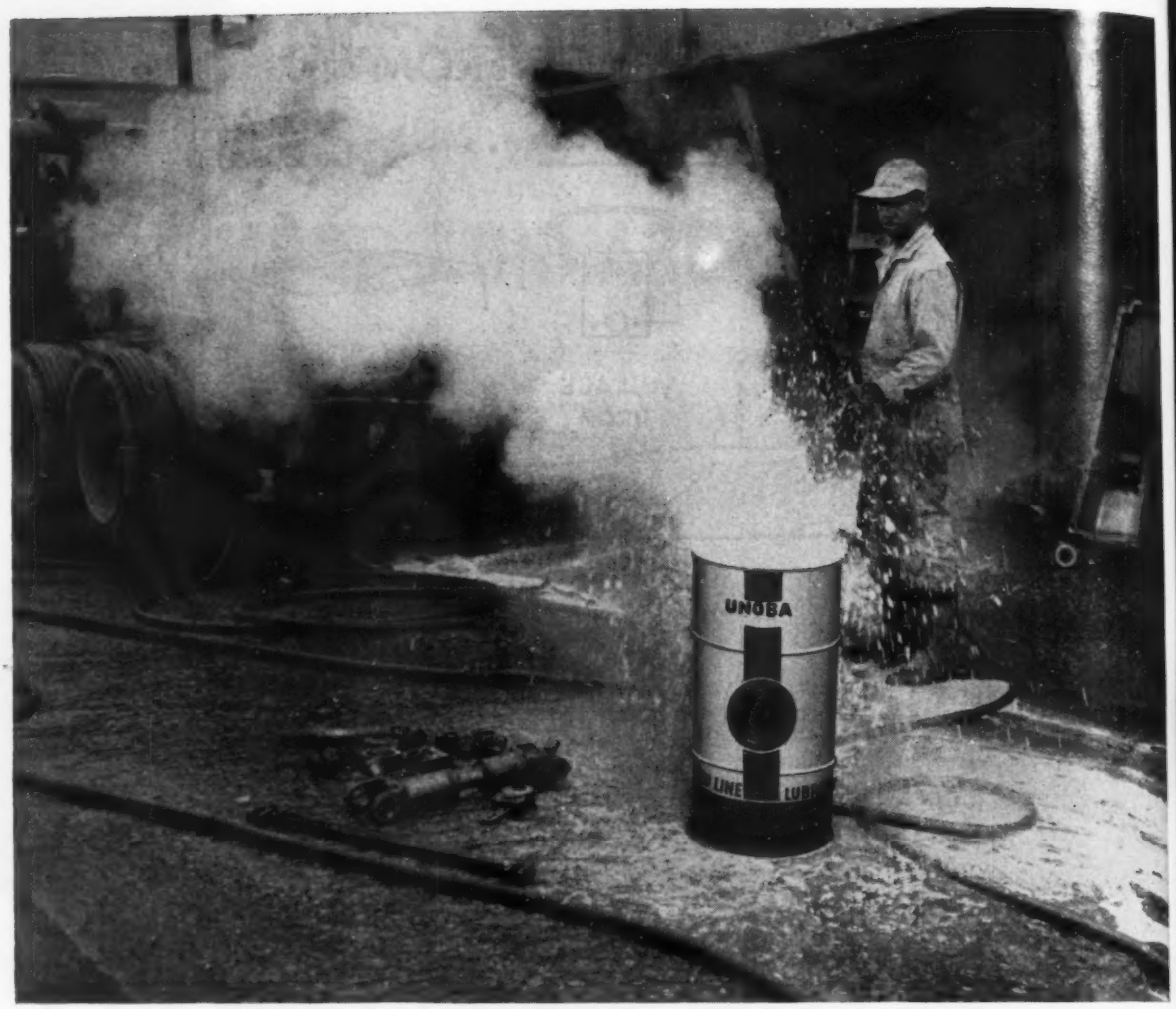
All this means economy because *one* break in cheap cable costs more than you can save by buying on price. For a sample of this new cable, call your Anaconda Sales Office or Distributor. *Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.* 58302

ANACONDA

TODAY'S HEADQUARTERS FOR MINE CABLE

*U. S. Patent No. 2,455,773





How an empty barrel proved

UNOBA RESISTS STEAM!

"Last week I told one of my men to steam out an empty UNOBA barrel for use as a trash container. In about an hour he came back complaining that it couldn't be done. He had used the steam cleaner, with chemicals, for over 30 minutes without visible success. The UNOBA, though slightly lighter in color, was still clinging to the sides of the barrel, and still looked and felt good enough to use. You see, we've been sold on Union's products by their performance."

In this unplanned "test," William Gardner, Equipment Superintendent for J. H. Welsh & Son, Contracting Company, of Phoenix, Arizona, proved again that UNOBA grease resists *extremes* of temperature and moisture.

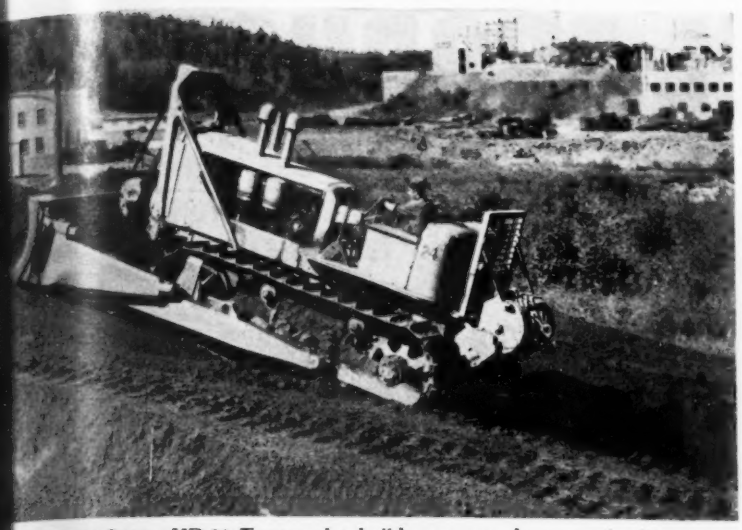
And many leading mining companies have found through experience that UNOBA's amazing ability to cling to metal gives outstanding protection against rust and corrosion. And multi-purpose UNOBA has saved them time and money by reducing grease inventories and eliminating the use of the wrong lubricants on expensive equipment.

Give *your* equipment and machines the dependable protection of multi-purpose UNOBA grease.

OFFICES: LOS ANGELES: Union Oil Building • NEW YORK: 45 Rockefeller Plaza • CHICAGO: 1612 Bankers Building
CINCINNATI: 2111 Carew Tower Building • NEW ORLEANS: 644 National Bank of Commerce Building

UNION OIL 76 COMPANY OF CALIFORNIA

EW TRENDS IN MINING MECHANIZATION



TODAY's demands on mining production require the selection of equipment of the broadest versatility. Allis-Chalmers offers a complete range of material moving and handling equipment — including four sizes of diesel crawler tractors, motor graders, pull scrapers, high-speed Motor Scrapers and Motor Wagons — designed to fit your particular mining applications and to deliver the highest possible output.

Here are some on-the-job views with a few of the many ways in which these modern machines are speeding production and lowering costs.

...iles processed ore. HD-20 Tractor also builds access roads . . . maintains ...s dumps . . . cleans up around shovels . . . cuts drainage ditches . . . digs ...basins and sluice-ways . . . builds reservoirs and pond dams . . . clears and ...building sites . . . tows equipment.

...s ore underground. HD-5G Tractor ...el also loads sand and gravel, other ...materials . . . cleans up around con...rs and hoppers. Special materials ...ets, bulldozer blades, other attach...s available. Tractor shovels available ...all sizes of Allis-Chalmers crawler ...ors.

Builds and maintains haul roads. AD-40 Motor Grader levels pit bottoms . . . digs and grades for drainage . . . scarifies . . . prepares dragline sites. Gasoline-powered Model D Grader also available. Handles routine road maintenance — light construction, etc.

Strips overburden. 13-yard heaped capacity TS-200 Motor Scraper also loads, hauls material from open pit . . . clears and levels for camp sites and drill setups . . . levels and grades building sites . . . hauls in supplies. Larger 18-yard heaped capacity TS-300 also available.

Hauls rock overburden. TR-200 Motor Wagon hauls tailings, sand, gravel, silicon, lead and zinc ore. Unit travels fast "off-road" with capacity loads . . . dumps clean every time with 18-ton, hydraulic-controlled rear-dump body. Sides channel-ribbed for rigidity.

Levels tailings dump. HD-20 Tractor with pull-type scraper also loads and hauls ore-bearing material — handles large-scale stripping jobs. Exclusive Allis-Chalmers hydraulic torque converter on HD-20 gives higher output, less upkeep on pulling, pushing and dozing work.

Complete line of pull-type scrapers available, from 2-yard to 18-yard sizes.

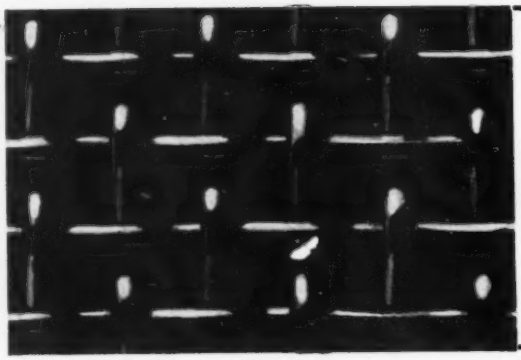
ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

CF&I STEEL PRODUCTS for

WICKWIRE ROPE

Over 125 years of experience in the manufacture of wire and wire products stands behind Wickwire Rope. It is made from wire with the maximum degree of hardness, strength, toughness and fatigue resistance. Quality controls, through the manufacturing process, assure the utmost in performance, safety and long life.



CAL-WIC INDUSTRIAL SCREENS

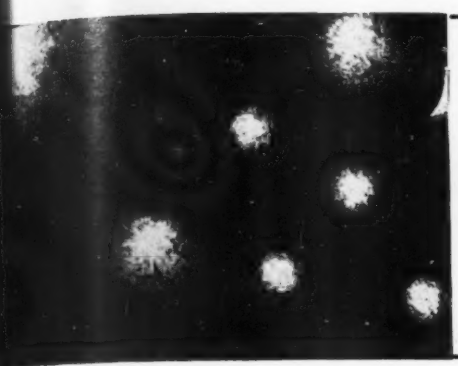
For every screening operation there is a Cal-Wic Screen that will give maximum output of the desired product with minimum wear. They are woven to the most exacting tolerances for the greatest efficiency.

CF&I ROCK BOLTS

This modern means of mine roof or wall support provides greater safety, economy and better housekeeping. Slot and wedge type, as illustrated, or expansion shell type.

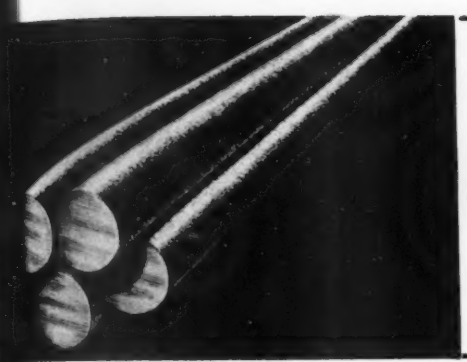
From ore to finished product . . . CF&I mining specialties are products of a completely integrated operation. They are manufactured to the high standards of quality recognized by the mining industry.

MINING'S GREATEST ERA



CF&I GRINDING BALLS

CF&I Grinding Balls are forged from special analysis steel to give high impact and abrasion resistance . . . the balance between toughness and hardness insures greater through-put, even wear and high efficiency.



CF&I GRINDING RODS

Rolled from special analysis steel for efficient, economical grinding. Machine straightened with square cut ends. Equally effective for Fine Crushing or Coarse Grinding.

CF&I MINE RAILS & ACCESSORIES

Made to A.R.A. standards; available in a range from 12 to 45 pounds. Accessories include splice bars, angle bars, spikes, track bolts and nuts—square or hexagon.

1758

THE COLORADO FUEL AND IRON CORPORATION • Denver, Colorado

WICKWIRE SPENCER STEEL DIVISION • New York, New York PACIFIC COAST DIVISION • Oakland, California

THE COLORADO FUEL AND IRON CORPORATION

CFI

No costly delays to change steels with TIMKEN® interchangeable rock bits!

Dozens of different Timken® rock bits fit the same drill steel!

YOU get quick bit changes plus the right bit for the job when you use Timken® multi-use and carbide insert bits.

It takes just a minute to unscrew one type of Timken bit and screw another different bit on the same drill steel—right on the job! No time wasted going after another set of drill steels.

You get added drilling economy because the driller can switch to the most economical bit as the ground changes. And you eliminate the need for stocking a large inventory of different steels. Dozens of different Timken multi-use and carbide insert bits are interchangeable on the *same* drill steel.

Both Timken multi-use and carbide insert bits give you two important advantages: 1) made from electric furnace Timken alloy steel, 2) special shoulder union that keeps drilling impact from damaging threads.

Our rock bit engineers will be glad to help you with your drilling problems. They're experts in cutting drilling costs. There's no obligation. Write The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".

WHERE YOU CUT COSTS WITH TIMKEN MULTI-USE BITS

Most economical for ordinary ground. With correct and controlled reconditioning, they give lowest costs per foot of hole when full increments of steel can be drilled.

WHERE YOU CUT COSTS WITH TIMKEN CARBIDE INSERT BITS

Give highest speed through hard, abrasive ground. Also most economical for constant-gage holes, small-diameter holes, very deep holes.

... your best bet for the best bit ... for every job

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

THIS GIANT 60 x 109 gyratory crusher now being built in Allis-Chalmers shops will be capable of crushing 3500 tons of low grade iron ore an hour!

It is one of many contributions made since Allis-Chalmers first started the development of equipment for processing taconite ore . . . in the laboratory . . . in the pilot plant . . . and in actual operations on the iron range.

Other metallic ore producers, too, have looked to Allis-Chalmers, *world's most experienced manufacturer of processing equipment,* for crushers, grinding mills, screens and smelting machinery. Allis-Chalmers leadership assures you of equipment recommendations backed by *unsurpassed* experience in all phases of processing.

You'll find the A-C representative in your area a helpful consultant on your processing problems. Call him, or write Allis-Chalmers, Milwaukee 1, Wisconsin, for more facts.

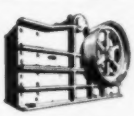
A-3998

ALLIS-CHALMERS

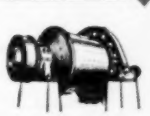
Sales Offices in Principal Cities in the U. S. A. Distributors Throughout the World.

Hammermills

Vibrating Screens


Jaw Crushers

Gyratory Crushers


Grinding Mills

Kilns, Coolers, Dryers

USED TO DESTRUCTION...NO RESHARPENING

Liddicoat

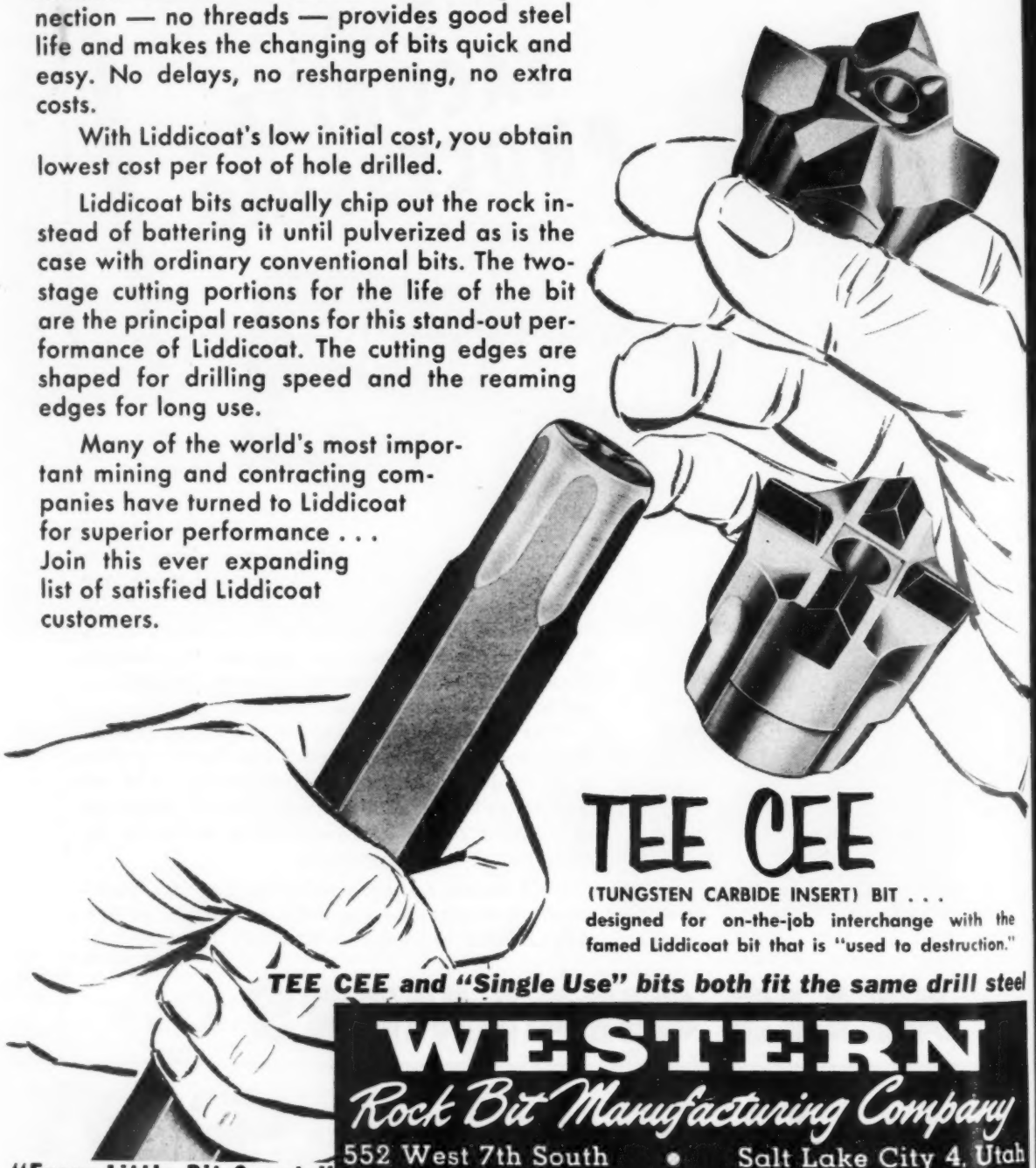
...the bit that drills farther, faster, for less

Liddicoat detachable bits are used to destruction and then discarded. The strong connection — no threads — provides good steel life and makes the changing of bits quick and easy. No delays, no resharpening, no extra costs.

With Liddicoat's low initial cost, you obtain lowest cost per foot of hole drilled.

Liddicoat bits actually chip out the rock instead of battering it until pulverized as is the case with ordinary conventional bits. The two-stage cutting portions for the life of the bit are the principal reasons for this stand-out performance of Liddicoat. The cutting edges are shaped for drilling speed and the reaming edges for long use.

Many of the world's most important mining and contracting companies have turned to Liddicoat for superior performance . . . Join this ever expanding list of satisfied Liddicoat customers.



TEE CEE

(TUNGSTEN CARBIDE INSERT) BIT . . . designed for on-the-job interchange with the famed Liddicoat bit that is "used to destruction."

TEE CEE and "Single Use" bits both fit the same drill steel

WESTERN

Rock Bit Manufacturing Company

552 West 7th South • Salt Lake City 4, Utah

"Every Little Bit Counts"

Here's your best wire rope buy—

Mining ropes that are about 15% stronger than Plow Steel, *yet cost only 5% more!*

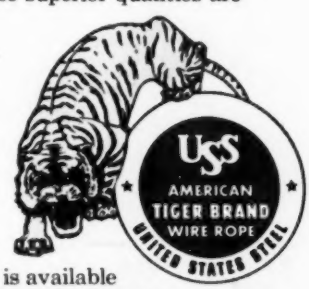
You'll get more for your money every time by using Monitor Steel grade of Tiger Brand Wire Rope in your mining operations. It's stronger, tougher, and more wear-resistant than any other standard grade of wire rope. For example, Tiger Brand Monitor Steel is about 15% stronger than Plow Steel. Yet, for all its superior qualities, Monitor Steel costs only 5% more. And because of these qualities, it is better suited to any mining-rope job you have.

As a shaft- or slope-hoist rope, Monitor Steel is stronger and more resistant to wear and fatigue. These superior properties mean greater safety and more economical operation for you.

As a slusher rope, Monitor Steel saves you money because it extends the intervals between replacements. Monitor Steel's ability to take punishment means less down-time for rope repair and replacement.

In strip mining, Monitor Steel pays off again, for it's made to give you longer, more dependable service on power shovels, dozers, and other rope-using equipment.

Remember that all of these superior qualities are yours at little extra cost. That's why Tiger Brand Monitor Steel is your best wire rope buy. It comes in a type and size to meet every mining application and requirement.



Monitor Steel has no equal for mining-rope applications and is available only in U·S·S American Tiger Brand Wire Rope. For advice on the best type of Tiger Brand Monitor Steel Wire Rope for your mining-rope jobs, you're welcome to the services of a Tiger Brand Field Specialist. Contact your local distributor or write to Columbia-Geneva Steel, 1403 Russ Building, San Francisco 6.

U·S·S TIGER BRAND Wire Rope

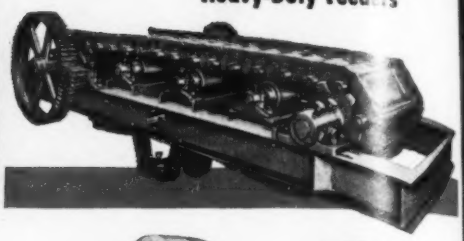
Columbia-Geneva Steel Division, United States Steel Corporation, San Francisco
In the East: American Steel & Wire Division, Cleveland, Ohio

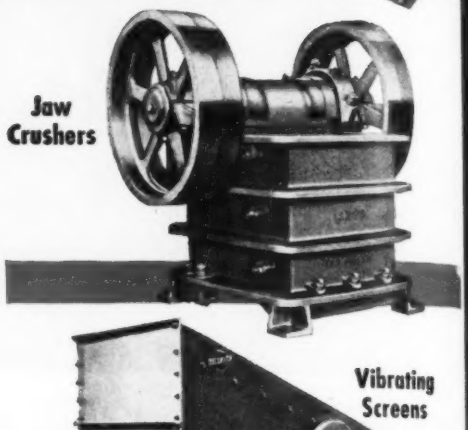
UNITED STATES STEEL

TELSMITH

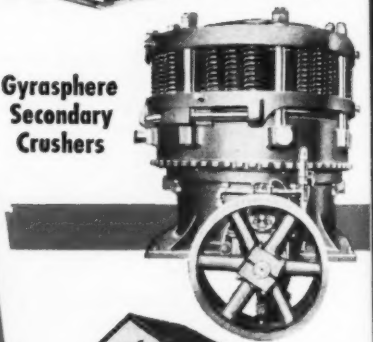
feeding
coarse crushing
screening
fine crushing

EQUIPMENT FOR MINES


Heavy-Duty Feeders


Jaw Crushers

Vibrating Screens


Gyrasphere Secondary Crushers

SMITH ENGINEERING WORKS, 4034 N. HOLTON ST., MILWAUKEE 12, WISCONSIN

Mine & Smelter Supply Co., Denver 17, Colo. — Fouiger Eqpt. Co., Salt Lake City, Utah — Mines Eng. & Equip. Co., San Francisco 4, Calif. — Robert S. Bailey, 816 W. 6th St., Los Angeles 17, Calif.

Lee Hodman Equip. Co., Phoenix, Arizona — The Sawtooth Company, Boise, Idaho — General Machinery Co., Spokane 31, Wash. — Clyde Equipment Co., Portland 9, Ore. Seattle 4, Wash. — Gordon Russell, Ltd., Vancouver, B.C.

—Drifts and Crosscuts—

Sydvaranger i tredimensjonal foto

Spesialartikler i amerikansk tidsskrift

Karel Wegkamp er navnet på en amerikansk tidsskriftredaktør som for tiden er i Kirkenes. Han representerer et stort tidsskriftforlag som utgir en lang rekke store magasiner med leserkrets over hele verden. I et av disse tidsskriftene «World Mining» skal han skrive en rekke artikler om A/S Sydvarangers anlegg, og får dessuten opp en fargefilm fra verkets avdelinger. Han skal også ta tredimensjonale fargefotografier som skal vises for gruvefolk i USA.

OCTOBER IS SYDVARANGER ISSUE—For those of you who can read Norwegian, the accompanying clipping from the Kirkenes, Norway newspaper tells the story about Karel Wegkamp's inspection of the Akieteselskabet Sydvaranger iron ore mining and beneficiation plant—the only commercial taconite operation in the world. This column has advised readers of the extended European trip Mr. Wegkamp has made and the timeliness and importance of his full report on the Sydvaranger operation.

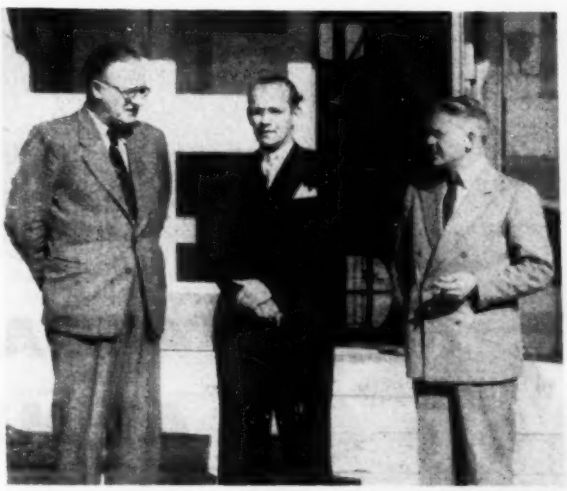
Of particular interest to the Norwegians was he complete set of camera equipment, including three-imensional colored cameras, that he carried. His pic-ures are excellent, and they vividly portray the adop-ion of United States equipment and methods to this mportant European source of low-phosphorus, high-rade concentrate.

It is seldom that an engineering staff has the oppor-unity to equip, modernize, and rebuild a 2,500,000-ton-er-year operation after a 10-year shut down. Syd-aranger officials did, and they took full advantages of orld-wide developments during the enforced World ar II closing and post-war rebuilding years.

Biggest change has been in the open-pit mining perations. Before the war, coyote hole blasting, steam hovel loading, small railroad cars, and steam locomo-ive haulage were used. Today the north open pit at Bjornevatan is a far different operation. Blast holes are drilled with churn drills; a Bucyrus-Erie 120-B electric shovel with a 4½-cubic-yard dipper loads 35-ton Tournarockers and 22-ton Euclid end-dump Diesel trucks. In the mill, crushing is by Symons cones, the primary grinding circuit comprises Nordberg ball mills and Duplex Akins classifiers, followed by magnetic separation in specially designed Sydvaranger separators. Concentrate is reground and magnetically cleaned.

That's only the start of the story. The complete Sydvaranger report will be in the October issue of MINING WORLD.

The fine cooperation and sincere interest in the entire project by AS Sydvaranger and its officials and employees, particularly J. Kraft-Johanssen, managing director, and Hans Torgersrud, works manager, made Mr. Wegkamp's visit possible and insures the most timely mining story today.



Welcome to Sydvaranger from J. Kraft-Johanssen, managing director (right); and Hans Torgersrud, works manager (left), is received by Karel Wegkamp.

CHALLENGING OBLIGATION—With the May issue, MINING WORLD and WORLD MINING reached an all-time igh in circulation and readership—10,542 for MINING ORLD and 10,100 for WORLD MINING.

Never in the history of mining has such a large, iversified, and geographically separated group of min-ral industry engineers read the same technical publica-on. In the nine primary mining states acounting for 3 percent of the mine tonnage MINING WORLD has larg-st readership of any journal of the industry. In the oreign field the combined readership, of both, has no val.

It is read where ever metals and nonmetals are sought, iscovered, mined, concentrated, smelted, and refined. forms a common medium for expression and exchange f ideas, experiences, and results, to collectively advance he sciences of minerals technology.

Perforce, this places an important and challenging bligation on the Editors. Readers demand the best in technical reporting, the latest in mining developments, and the most accurate in industry operational changes. The Editors will continue to meet the challenge and extend thanks to all readers for their interest and constructive criticism.

WESTERN MINING CAMPS—So popular have been the "Ghost Camp" articles written and illustrated by Muriel Sibell Wolle for MINING WORLD that she, by popular demand, has completed a series describing early-day mining camps in 12 western states. Stories to date have all dealt with Colorado, which is her home. The new series will afford increased reader interest for those who know a specific camp well; and give to all a more detailed report of the early-day camps of the west. The first describes the boom days at Oregon's famous Cornucopia gold camp. Watch for a report of early days at your favorite camp.

4-STAR PERFORMANCE AT MINNEWAS

Look where you will, you'll have a hard time matching the all-round performance of the Cat* D7 Tractor and No. 7A hydraulic Bulldozer that works for E. A. Young, Inc., at the Minnewas open-pit iron ore mine, Virginia, Minn. Here are some of the jobs this rugged, perfectly matched "team" does:

1. Strips from 40 to 60 ft. of overburden consisting of gravel, clay and rock.
2. 'Dozes spill around the shovel, as you see above.
3. Works hard on the dump.
4. Gives an assist to haul trucks.

Versatile Caterpillar-built Bulldozers and track-type Tractors can do many low-cost earthmoving jobs for you, too. Nothing else can equal their sturdy construction, well-engineered design and stay-on-the-job dependability. Exclusive 'dozer features include good balance and operator visibility and easy-to-make blade adjustments . . . plus heavily reinforced, rigid blade that digs and *rolls* a full load every time. And Cat Diesel Tractors are world-famous for high drawbar horsepower, easy operation and minimum down time.

See your dealer for an on-the-job demonstration—soon.

Caterpillar Tractor Co., San Leandro, Calif.; Peoria, Ill.

CATERPILLAR

*Both Cat and Caterpillar are registered trademarks

NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

CAPITOL CONCENTRATES

MALL BUSINESS REGULATIONS UST BE WATCHED BY MINERS

In the conference report on the Small Business Administration bill H.R. 5141, the conferees have repeated their assurance "that a producer of strategic and critical minerals and metals is as eligible for assistance under the Small Business Act of 1953 as any other business concern if it meets the criteria for a small business concern under the Act."

As mining has for some years been almost completely ignored by the RFC and quite completely by the Small Defense Plants Corporation, this statement of policy for the new SBA should be of considerable significance to the mining industry. It will be important, however, for the sponsoring Senators and Representatives from mining states to see to it that the new agency does not write rules and regulations which will exclude mining as effectively as though this congressional policy had never been stated. Such technique on the part of the bureaucracy is only too well known and specifically was resorted to by the RFC as soon as the congressional mining directive was amended out of the RFC Act. They'll do it every time!

Reservation Of Leaseable Minerals Proposed

A recent Senate Report (Report No. 593 with S. 1397) contains a letter from Interior Assistant Secretary Wormser in which it is advocated that there be a reservation to the government of "leasable minerals in all future mining claims." Accompanying the Wormser letter is the draft of a bill proposed by the Interior Department containing this section:

"Sec. 2. All mining locations made on or after the effective date of this Act pursuant to Section 1 of this Act and all mining locations declared to be valid under Section 1 of this Act shall be subject to a reservation to the United States of all minerals subject to disposition under the mineral leasing laws together with the right to dispose of such minerals under such laws. Any patents issued for mining claims described in this section shall contain the reservation of leasable minerals provided for in this section."

The mining industry now is in a wrangle with the Forest Service on the Hope bill, which would provide for multiple use of the surface of mining claims. How would you like the multiple ownership of the minerals such a bill would provide?

McCarthy Plans Mineral Investigation

Rumors for some time have said that Senator McCarthy would investigate the mineral stockpiling program. Recently, the Senator stated that during the congressional recess he would have members of his Subcommittee on Government Operations take testimony in the mining states to find out if bad governmental planning has resulted in "a well-nigh ruined domestic mining industry and has caused this nation to be dependent on foreign supplies."

There scarcely is a miner or a congressman from a mining state who does not know what the trouble is. The problem has been placed on the record of committee after committee from one end of the country to the other. However, perhaps it will take someone as energetic and vocal as Senator McCarthy to get something done about it.

Is It Too Much To Ask?

Although the zinc and lead portions of the stockpile are said to be complete, this only means that commitments have been made. Washington gossip has it that much of the material is of foreign origin for future delivery—which would not help much in case of war.

The stockpile purchase authority could and should be used to help the domestic mining industry. Instead, the stockpile is used regularly to forward diplomatic goals. We are supposed to have plenty of tin, but when Bolivia needs help we buy. We are supposed to have plenty of rubber, yet when Malaya needs help we talk of buying more. Even quicksilver, with which the stockpile has been supposedly saturated for a long time, may be bought to aid Spain.

Why not help our own mining industry by buying lead and zinc, or is that asking too much?

DMEA Program Is Extended

On July 22, 1953, the Defense Minerals Exploration Administration announced that it had passed the 500 mark in Defense Minerals Exploration contracts. Before the passage of the extension of the Defense Production Act it appeared as though this agency would have to fold up but, although extremely curtailed in activity, its life has been extended. Within the limits of its rather bad policy directive, DMEA has functioned better than any government agency concerned with mining. Its applications have been handled with as much expedition as could be expected considering its dependence upon the United States Geological Survey and the U. S. Bureau of Mines for examinations and reports. Its engineers not infrequently have had the guts to reverse recommendations of the field teams. Administrator Mittendorf recently was given a distinguished service medal by the Interior Department, one he certainly earned and deserved.

Ask Foreign Price Investigation

Seven House members—four Republicans and three Democrats—have joined in a protest against what is termed United States government subsidies for foreign producers of lead and zinc.

In a letter to Chairman Hill of the House Small Business Committee they asked for a full investigation of the charge that the Defense Materials Procurement Agency has negotiated lead and zinc contracts abroad at prices "well above the domestic market price."

The protest was signed by Republicans Short of Missouri, Stringfellow of Utah, Young of Nevada and George of Kansas. Also, by Democrats Pfost of Idaho, Metcalf of Montana, and Edmondson of Oklahoma.

Some Lead-Zinc Action

The definite failure, because of Administration opposition, to secure Congressional action on the lead-zinc sliding scale tariff did bring about one encouraging step that may result in the desired goal next year.

The House Ways and Means Committee and the

Metallurgy never has been—and never will be—a static science. Year after year, new reagents and processes and new combinations of older reagents and methods tend to obsolete many time-honored beneficiation practices.

A re-study of your ore-dressing methods at this time may reveal worthwhile opportunities for cutting costs, improving recovery, or both. Newer Cyanamid Reagents or new methods of using older Cyanamid Reagents have helped others and may help you. You may be able to use Heavy-Media Separation or the Dutch State Mines Cyclone Separator Processes to cut milling costs.

Cyanamid Field Engineers stand ready to work with you in modernizing your flow schemes. On request, we will be pleased to have the Cyanamid Field Engineer nearest to your mill call upon you.

AMERICAN
Cyanamid
COMPANY
MINERAL DRESSING DIVISION
30 ROCKEFELLER PLAZA, NEW YORK 20, NEW YORK

Senate Finance Committee have approved a resolution directing the Tariff Commission to investigate the effect which lead and zinc imports are having on the domestic industry. The report must be submitted by March 15 of next year.

This action gives assurance that the subject will not be pigeon-holed and allowed to perish. However, it is difficult to understand the need for months of study to find out what everyone has known for nearly a year. Are not the shut-down mines sufficient testimony?

• *Smith Again Advocates Repeal*

Representative Smith of Mississippi is on the rampage again against the "Buy American" Act. He has been advocating its repeal for a long time. At a meeting recently of 100 members of the American Association of Machinery Importers, Smith said the act had cost the taxpayers $10,000,000,000, but he did not support the statement with detailed figures. How much it has saved the wage earners and taxpayers is quite another matter and we may be quite a few billions in the black if both sides of the ledger are checked. Representative Smith, it would seem, is more interested in building up the Port of New Orleans than in keeping American industry alive and American wage earners in jobs. Although the mining industry never has had the help from this act that it should have had, let's not lose that little.

• *South African Gold Miners Protest*

It seems that South African gold miners are squawking mightily about the cost of producing gold. The costs of one major producer have gone up to $33.00 per ounce.

• *Gold Committee Would Have Unusual Membership*

Senate Joint Resolution 109 by Senator James E. Murray of Montana, to establish a joint committee to investigate the gold mining industry, has a unique feature. The Joint Committee consisting of 16 members, which the bill proposes, would be composed of five members of the Senate, five members of the House and "six members from persons in private life who are familiar with the gold mining industry."

We are used to boards and advisory committees with industry members, but a joint investigating committee of the Congress with members who are not Congressmen is a novel device. It sounds like a good idea and could readily result in a report which would be far more constructive and penetrating than that of the usual investigating committee.

It is high time that a careful study be made of the ills of the domestic gold mining industry and what the Congress can do to cure them. The current proposal was introduced at the instance of the Montana Legislature.

COMING CONVENTIONS

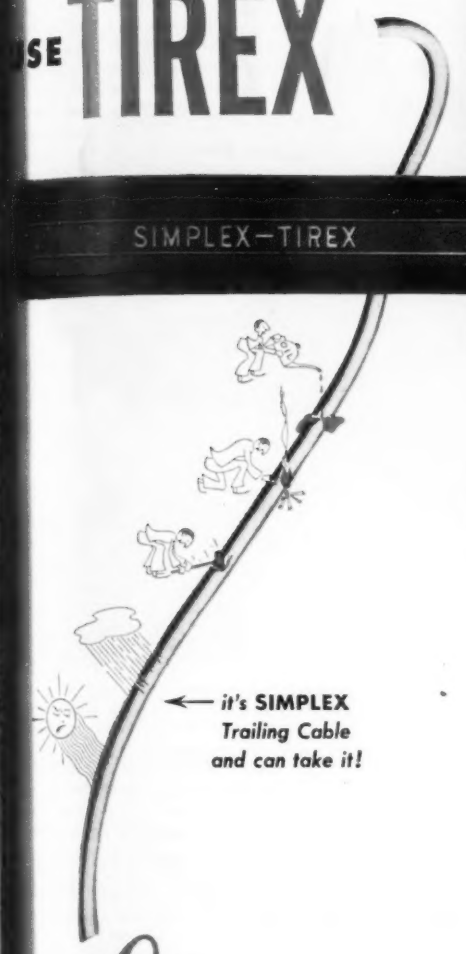
September 21 to 24, 1953, WESTERN DIVISION AMC MEETING, Olympic Hotel, Seattle, Washington.

October 15 to 17, 1953. NATIONAL CLAY MINERALS CONFERENCE, sponsored by the National Research Council. University of Missouri, Columbia, Missouri.

October 19 through 23, 1953. The 41st NATIONAL SAFETY CONGRESS AND EXPOSITION (mining sessions afternoons of October 19 and 20). Conrad Hilton Hotel, Chicago, Illinois.

October 28 through 31. INTERNATIONAL MINING DAYS sponsored by the New Mexico Mining Association and the Mining Committee of the El Paso, Texas Chamber of Commerce, El Paso, Texas.

WHERE Steady Power COUNTS... USE TIREX



← *it's* **SIMPLEX** *Trailing Cable and can take it!*

It's dig and dump, dig and dump, all day, every working day. That's the kind of operation that reduces costs and builds profits. Stop this shovel for one day and you come close to paying the price of a new cable. The output of this shovel is chiefly determined by the performance of its TIREX Trailing Cable. And output must be high.

Here's why TIREX Trailing Cable will stay on the job indefinitely. It has a tough neoprene armor that provides exceptional resistance to wear and tear. The smooth, dense jacket of TIREX Trailing Cable is a product of the *cured-in-lead* process that provides excellent resistance to abrasion, snagging and crushing. TIREX Trailing Cable offers a balanced resistance to oils, grease, moisture, flame and sunlight.

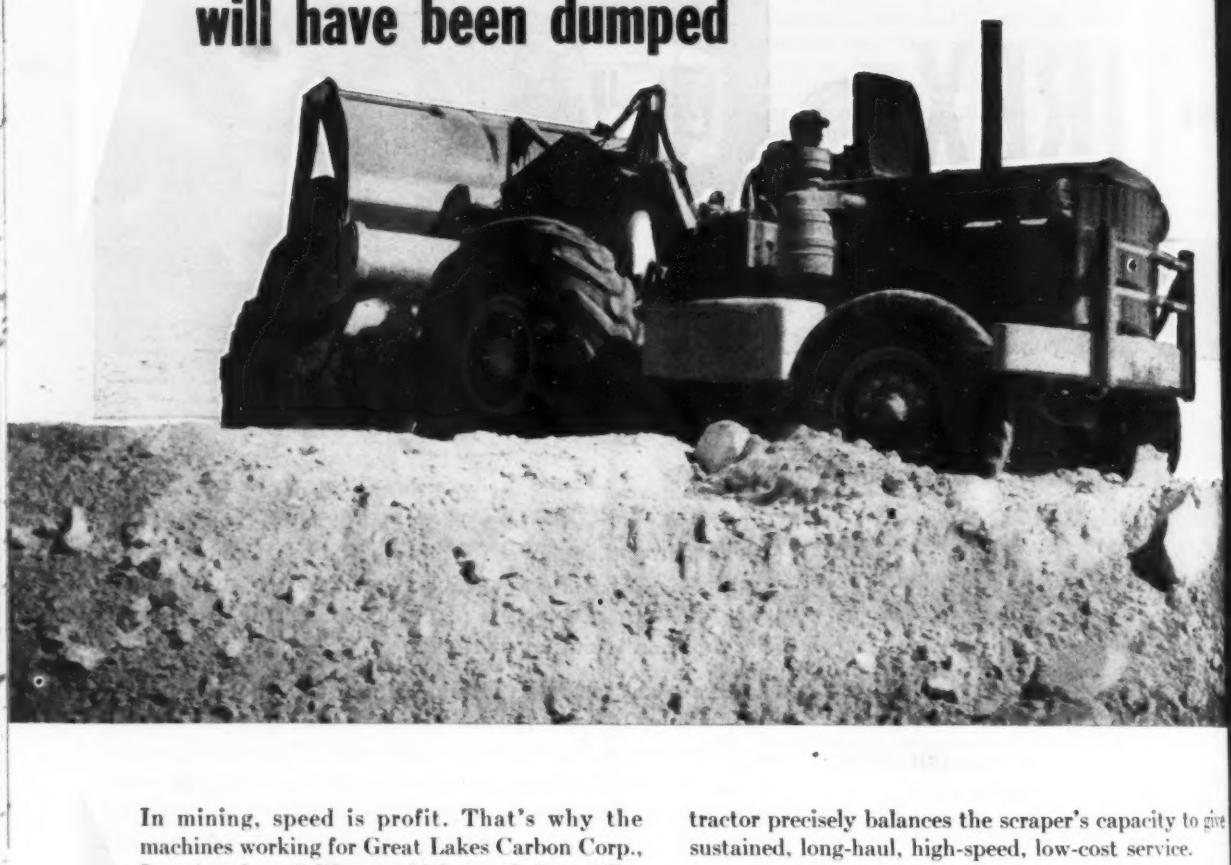
Specify and get TIREX Trailing Cable for this important reason: It is always on the job — always ready to work. TIREX Trailing Cable is always marked for your protection. Contact your nearest Simplex representative or write for more complete information.

Simplex WIRES & CABLES

TIREX **CORDS AND CABLES** *are made only by the*

SIMPLEX WIRE & CABLE CO., 79 Sidney Street, Cambridge 39, Massachusetts

By the time you finish the first paragraph, 22 yds. of Dicalite will have been dumped



In mining, speed is profit. That's why the machines working for Great Lakes Carbon Corp., Los Angeles, Calif., are high-speed Caterpillar DW20 Tractors with matching No. 20 Scrapers. Carrying 22 loose yds. of Dicalite from pit to stockpile near Lompoc, Calif., these brawny units have a spreading time of *15 seconds*.

Each of Great Lakes Carbon's three DW20 units whips through seven trips an hour on a 1.2-mile haul. In one 10-hour day, the trio haul 4,620 yds. of Dicalite to the stockpile.

Unusual performance? No, sir! This unit is expected to deliver because it is all-Caterpillar built—every part created specifically for this type of work. There's extra power and capacity built into the Cat* DW20 Tractor and No. 20 Scraper team. The 225-HP engine in the tractor precisely balances the scraper's capacity to give sustained, long-haul, high-speed, low-cost service.

Quick spreading of any material results from the scraper's high apron lift and positive ejection. Combine this with its cable controls and you are positive of fast, sure loading and spreading.

But, just as important, this equipment is built for a long, productive life. Let your Caterpillar Dealer demonstrate these profit-building units. They're worth looking into.

Caterpillar Tractor Co., San Leandro, Calif.; Peoria, Ill.

CATERPILLAR

*Both Cat and Caterpillar are registered trademarks—R

NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

INTERNATIONAL PANORAMA

ONDON—Small quantities of manganese ore have been sold by Russia to Belgium, Germany, nd Italy for the first time in many years.

ASHINGTON, D.C.—With the signing of five more purchase contracts to buy manganese om Mexico, the DMPA has met its program goal of 550,000 tons. No further manganese ontracts are contemplated for this quarter of the year.

ALT LAKE CITY, UTAH—Salt Lake Tungsten Company will begin operation of its new tungsten efining plant this month with an estimated production of 200,000 tons of WO_3 monthly.

ANTIAGO, CHILE—The Chilean government reportedly has established a Copper Sales Corporation to handle the marketing of copper which previously had been handled through the Central Bank.

ASHINGTON, D.C.—The Export-Import Bank has authorized a loan of $2,500,000 for the Marcona Mining Company to assist in the financing of iron ore production from the company's peration in Peru.

ATURITA, COLORADO—Vanadium Corporation of America has received permission from the S. Atomic Energy Commission to install a roaster for processing vanadium-uranium ores at Naturita mill. The company also has an option to buy the uranium-vanadium mill at urango which it has operated under lease for the past five years.

LLEGHANEY, CALIFORNIA—A rich strike of free gold has been made at the Gold Crown ine. The mine is near the famous Original-16-to-1 and Oriental gold mines.

ONDA, IDAHO—After many years of underground mining, the Anaconda Copper Mining ompany is now open-pit mining phosphate rock from the outcrop above the mine workings.

ALLACE, IDAHO—American Smelting and Refining Company is raising on a vein of high-rade silver-copper ore at its Vulcan mine. The ore was first found on the 3,000-foot level ast year.

RAND JUNCTION, COLORADO—The United States Atomic Energy Commission has renewed contract with the Vanadium Corporation of America covering operation of the VCA Hite, ch uranium-copper pilot plant mill.

HICAGO, ILLINOIS—Cramet, Inc., subsidiary of the Crane Company, has signed a $24,950,-00 contract with the DMPA to build and operate a titanium metal plant. Planned plant apacity is 6,000 tons of ingots per year. DMPA must purchase 6,000 tons under contract rms and has an option for 7,500.

ANBERRA, AUSTRALIA—The government of the Commonwealth of Australia has raised the ice per pound of U_3O_8 from $2.04 to a maximum of $5.40 for 10 percent ore.

ASHINGTON, D.C.—The Defense Minerals Exploration Administration has signed 517 exploration contracts with a contractural value of $25,171,583. Exploration is underway for 26 inerals in 31 states and Alaska.

ATHURST, NEW BRUNSWICK—Assays of the core from diamond drill hole No. 9 at the Ancon ines Ltd.-Leadridge Mining Co., Ltd. showed 4.51 percent lead, 11.57 percent zinc, and 3.84 unces silver per ton over a length of 201 feet. Top of core was at a depth of 671 feet. eadridge is a St. Joseph Lead Company subsidiary.

SLO, NORWAY—Copper ore reserves at Grimsdal under development by Folldal Verk have een estimated at 1,000,000 tons.

RANTS PASS, OREGON—Chrome ore purchases by the United States Government purchase rogo: here are 2½ times larger than for the same period last year.

ASHINGTON, D.C.—Congress has passed a bill to extend the government purchases program r tungsten, manganese, chromite, mica, asbestos, beryl, and columbite-tantalite ores and oncentrates for an additional two years.

ARAMARIBO, SURINAM—The Kennecott Copper Corporation has started testing of its 21,000-re bauxite concession south of the large open-pit mine of the Moengo mine of the Surinam auxite Company Ltd.

ANILA, PHILIPPINE ISLANDS—General Base Metals, Inc., largest Philippine manganese proucer, is making an extensive geological survey of its properties on Bohol Island as a basis r a possible beneficiation plant.

UM JUNGLE, AUSTRALIA—The government of the Commonwealth of Australia has spent A 1,100,000 in the past five months for uranium development here. About £A 1,000,000 dditional will be spent in 1953 and 1954.

ASHINGTON, D.C.—The United States Tariff Commission has been instructed by the Senate inance Committee to make a thorough survey on lead and zinc imports and their effect on omestic mining and report on this investigation before March 31, 1954.

RAND JUNCTION, COLORADO—Uranium recovery from domestic ores was the highest in istory for the first six months of 1953. Nearly all came from Colorado Plateau ores, but for e first time uranium was recovered as a byproduct of phosphate rock processing.

UREKA, UTAH—Chief Consolidated Mining Company has plans for eight mine exploration ojects at a cost of $1,133,492 at its Chief No. 1 mine.

ANGOON, BURMA—The government of the Union of Burma is exploring a large zinc deposit at Lough Keng, southeast of Taunggyi in the Shan States of Upper Burma.

AO PAULO, BRAZIL—Beryl reserves in the Minas Gerais and Bahia districts have been estiated at 40,000 proved tons with a possible reserve as great as 200,000 tons.

ANILLA, PHILIPPINE ISLANDS—The United States Atomic Energy Commission has two geolots in the Philippines searching for uranium deposits.

Domestic Strategic Mineral Buying Program Extended

The government's purchase exploration and development program for domestically produced ores and concentrates of tungsten, manganese, chromite, mica, asbestos, beryl, and columbite-tantalite has been extended for two years.

Congressional passage of HR 2824 and presidental signature gives the mining industry added time and incentive to produce these metals and minerals. Plans can be made, mines developed, and concentrating plants built and placed in operation with an assured market for a long enough period to attract capital.

Under the Bill's provisions, purchase programs have been extended as follows: Tungsten, July 1, 1958; manganese June 30, 1958; beryl, June 30, 1957; chromite, June 30, 1957; mica, June 30, 1957; columbite-tantalite, December 31, 1958; and asbestos, October 1, 1957.

Kennecott In Surinam To Explore for Bauxite

Preliminary investigations are being made by the Kennecott Copper Corporation on bauxite concessions held by the Netherlands Guiana Bauxite Exploration Company Ltd. If these investigations justify closer examination of the property, some $250,000 may be spent for development.

The concessions cover about 21,000 acres and are located just south of the large Moengo mine operated by the Surinam Bauxite Company Ltd. A prospecting license has also been granted for another 111,000 acres near the Moengo.

Geologists J. Shaeffer, Th. A. F. Netlbeek, and A. Wood will conduct field operations. Part of the drilling and transporting equipment has already been delivered.

Government officials welcome foreign investments and activities, such as those of Kennecott and the African Selection Trust, Ltd., and stress the importance of the country's liberal taxation policy.

Mica Processing Plant Opened in Tanganyika

A second mica processing plant has been opened by the New African Mica Company in the Morogoro area of Tanganyika, about 140 miles inland from Dar-es-Salaam. The plant will concentrate on high-grade mica and most of its expanding production will go to Great Britain and the United States.

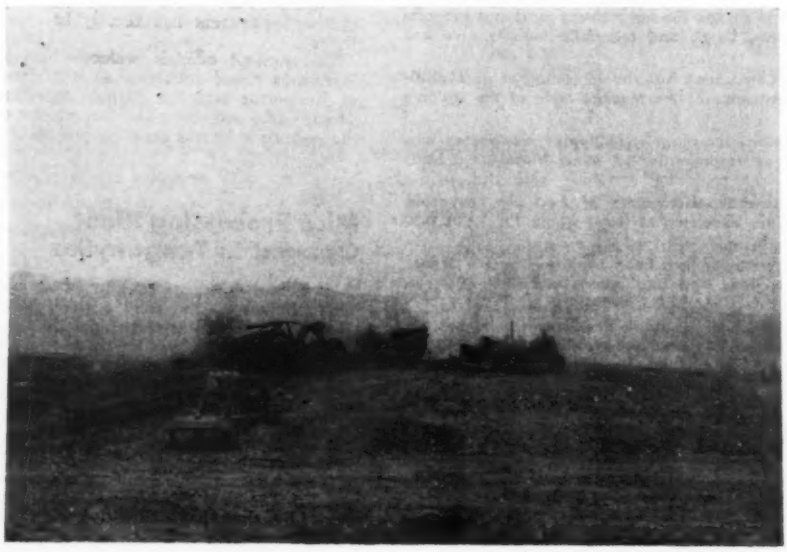
New African Mica is a joint venture of Van Eegagn & Maclaine (East Africa) and Otto Gereau & Company of New York. In the mica business only a year, reportedly they have already outgrown the capacity of their first plant.

General view of the Inspiration twin shafts, the mill, the leaching plant and the electrolytical refinery.

INSPIRATION IS COMBINING OPEN PIT MINING AND UNDERGROUND HAULAGE

At its Thornton open pit copper mine and twin hoisting shafts using a central transfer block to connect surface to underground haulage leve

Carryalls shown here loading overburden are normally used in the Thornton pit to load and haul broken ore to the top of the caving block that transfers the material underground. Conventional shovel-truck methods are used when the scrapers are employed on stripping. Rippers carried behind the pusher-dozers insure efficient scraper loading.



Inspiration Consolidated Copper Company is successfully using a unique combination of underground and open pit mining methods at the Inspiration, Arizona copper properties. Results favor lower costs.

Pit ore is mined and hauled to a central transfer block that connects the surface with the main haulage level of the underground workings. As ore is drawn from the block it is loaded and hauled to Inspiration's famous twin shafts and hoisted to the coarse ore bins for temporary storage before subsequent crushing, grinding, leaching, and electrolytic refining.

Certain particular characteristics of the Inspiration deposits that lend themselves to the new system and have made it possible are seldom found in other properties. Meaning, probably, that the methods used would seldom be applicable en toto to other properties.

First, Inspiration had existing high-speed, low-cost underground haulage and hoisting facilities. Second, little additional development was necessary to extend the existing underground main haulageway to a point beneath the open pit area. And third, the ore has excellent fragmentation characteristics yet stands with firm vertical walls at the periphery of a caving block.

Caved Block Ore Transfer

A standard caving block 100 feet long and 65 feet wide was developed and undercut beneath Inspiration's Thornton open pit. When caving reached the surface, ore mined in the pit was hauled to the caved block and dumped into the subsided area. Pulling ore from the block was confined to the afternoon shift and mining to the day shift. However it was found that excellent fragmentation (secondary blasting is nearly non-existant at Inspiration) obviated arching in the block and resulted in nearly perfect flow. In fact, as the accompanying series of photographs show, the first holes appear at the upper surface of the block within as little as five minutes after the first ore train is loaded underground. Walls stand well and stand nearly perfectly vertical—an important feature because funnelling or enlargement of the block at the surface would tend to destroy the efficiency of the method and make loading from trucks and carryalls hazardous.

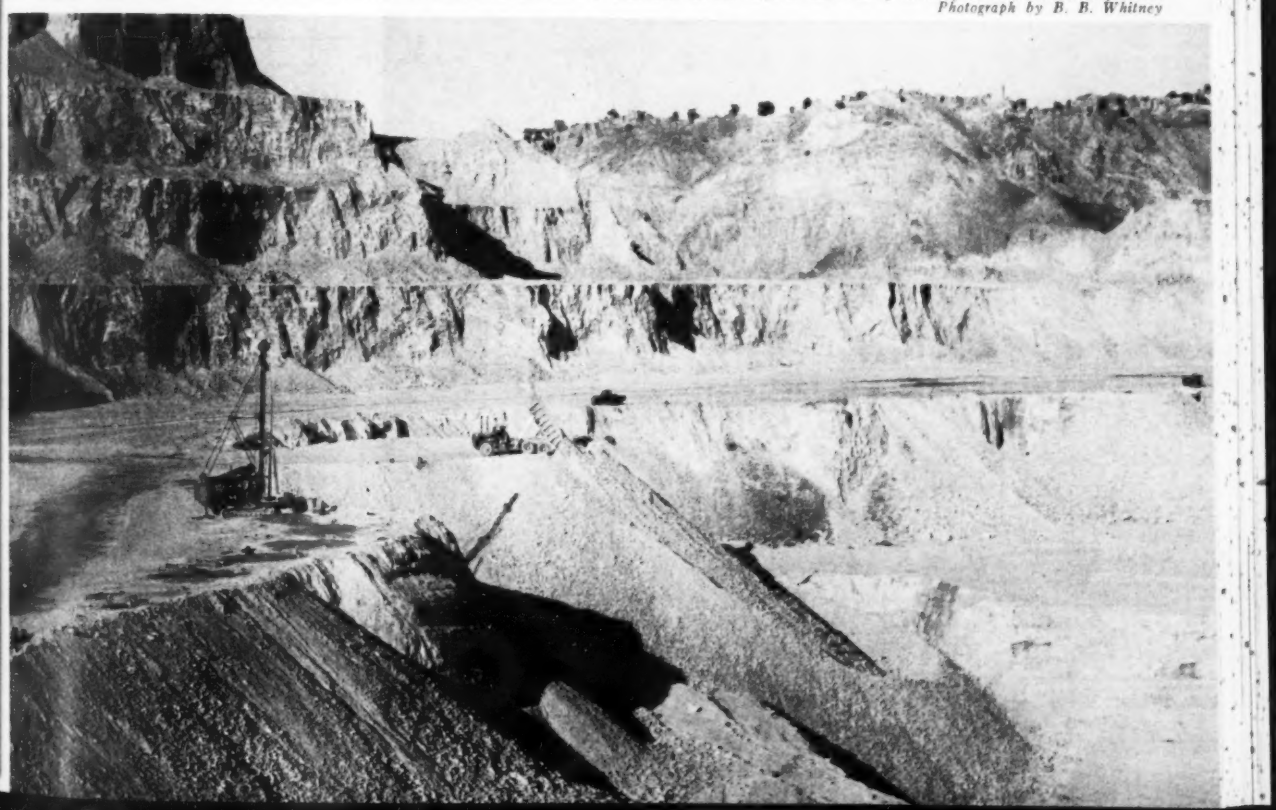
Shovels like this are used in Inspiration's Live Oak pit and the Thornton pit to load ore at the rate of 6,000 tons per shovel shift. Thirty-four-ton trucks haul the loaded material to the crusher, in the case of the Live Oak, and to the transfer block at the Thornton.

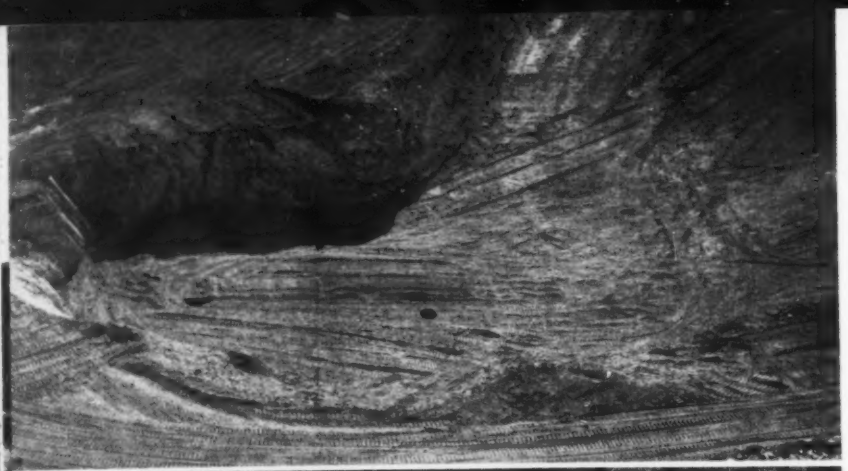
When experience demonstrated that there was no arching in the block nor danger from sudden surface subsidence in the caved area, loading and drawing no longer were necessarily confined to separate shifts. Tonnage requirements, however, are currently satisfied by a single shift and the original opposite-shift arrangement is retained. The amount of ore currently handled through the block averages about 5,000 tons per day.

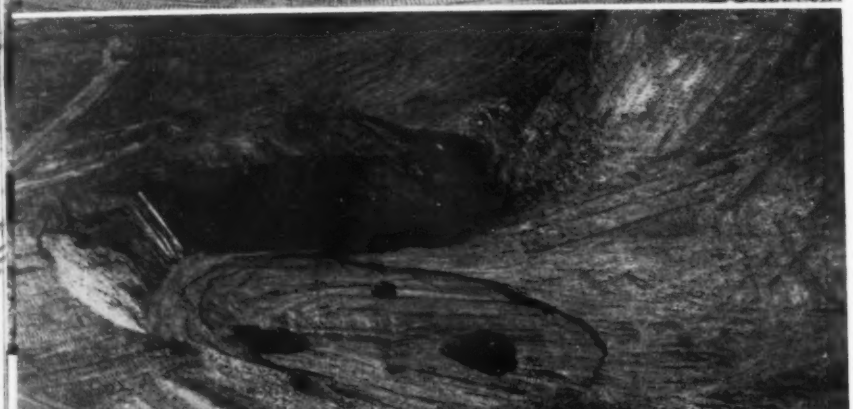
Thornton Pit Ore Transferred

Inspiration, has two active divisions—the Live Oak and the Thornton. From the Live Oak comes 3,500 tons of underground ore and nearly 5,000 tons of pit ore daily. The

Loaded trucks dump ore from a pit bench above the transfer block in the Thornton to the top of the block, already covered in this picture.
Photograph by B. B. Whitney







The remarkable, even fast subsidence at the surface of the transfer block in the Thornton pit is illustrated in these four pictures taken during a single shift by B. B. Whitney. The draw started at 8:17 AM and the first hole appeared at the surface at 8:22 AM. The first picture in this series was taken at 8:22 when the second surface hole appeared. By 9:40 when the second picture was taken five holes were visible and the entire surface of the block had begun to subside. The third picture shows, by 10:54, further subsidence had occurred and the holes were much enlarged. At the end of the shift's draw, 3:30 PM, there was an 8-foot drop of the undisturbed surface and 6,000 tons of ore had been pulled from the block. All pictures were taken looking from west to east.

Thornton, where the open pit ore is dropped through the caving block described above and hoisted to the surface, produces between 5,000 and 6,000 tons per day. Because Thornton ore is largely sulphide and because the leaching plant can handle but limited amounts of sulphides efficiently, these tonnage ratios are carefully maintained.

When pit development at Inspiration began (see MINING WORLD, April 1951, pp. 8-11), a modern crushing plant was installed to reduce the ore produced. With the new system at the Thornton, however, only the ore from the Live Oak Pit is handled in the crusher.

No Uphill Ore Trucking

The block transfer system was developed in the Thornton to eliminate the waste of time and expense involved in trucking the ore up the relatively long and steep grades out of the pit to the crusher, a condition that would become increasingly costly and time-consuming. A block 65 by 100 feet was undercut and caved by Inspiration's caving method directly beneath the Thornton pit. After the block holed through to the surface ore loads were diverted from the crusher to the caving area.

Three grizzly lines under the block control the rate and position of the ore draw and prevent passage of oversize to the transfer raises leading to the main haulageway. Oversize, though, could hardly be considered a problem due to the excellent fragmentation characteristics of Inspiration ore.

Through Grizzlies To Cars

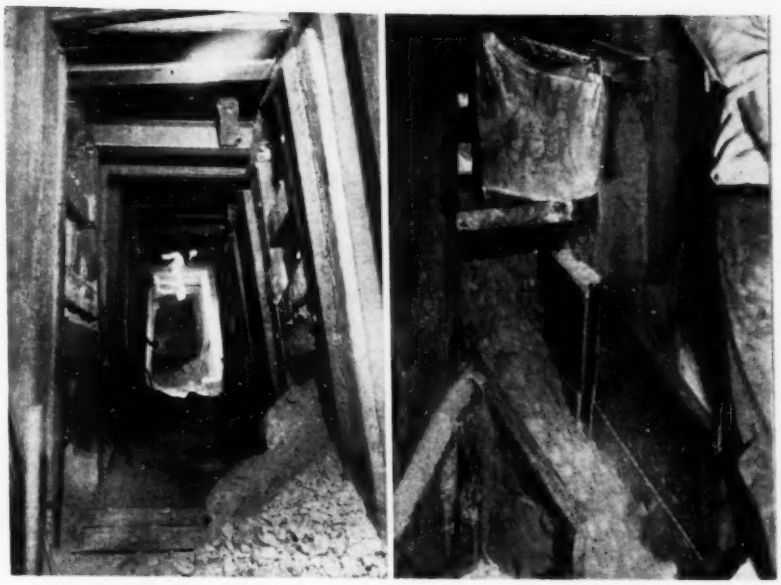
Grizzly lines—and hence transfer raises—are so placed that a 24-car

train can be loaded in three minutes. The chutes are exactly four car lengths apart, so that the first, fifth, and ninth cars are loaded at the same time followed by the second, sixth and tenth, and so on.

The total development required to provide the Thornton pit with the transfer block system included only the block development itself and 240 feet of extension to the main haulageway. In other words, only this development could be changed against the cost of the system; the haulage and hoisting facilities were already installed. And too, operating and maintenance expenses on these facilities are exceptionally low. The three-train haulage system is an efficient operation and Inspiration's twin-shaft, single-level, four compartment ore hoisting arrangement is one of the most automatic of its kind.

Lower Cost On Short Hauls

With the short, relatively level pit hauls afforded by the location of the transfer block, Inspiration's management, headed by general manager P. D. I. Honeyman and assistant general manager H. C. Weed, decided to try bulldozers and carryalls for loading and hauling the broken ore instead of the shovel-truck system common to most pits. Here again the fragmentation of the ore was a deciding factor because of the difficulty in loading a carryall with coarse material. Experiments were successful and it has now been found that on hauls less than 1,500 feet large carryalls actually give lower unit costs than shovels and trucks. The delimiting haul with smaller carryalls is considered to be about 1,000 feet. On longer hauls, the standard shovel-truck methods are used. And when stripping programs are underway, carryalls are transferred to overburden removal and shovels and trucks are used in the ore. Production averages 5,500 to 6,000 tons per shift with a 4-yard electric shovel. Two large number 90 carryalls and three bulldozers for pusher loading replace one shovel and four trucks. One of the bulldozers draws a three-tooth ripper to loosen the broken ore for the scrapers.



LEFT: One of the three grizzly lines that control the transfer block that handles production from the Thornton pit. Oversize—a minor problem at Inspiration due to the excellent fragmentation of the ore—is plugged and blasted on these grizzlies. RIGHT: The actual draw is controlled by air-powered reversed guillotine chute gates directly above the main haulageway.

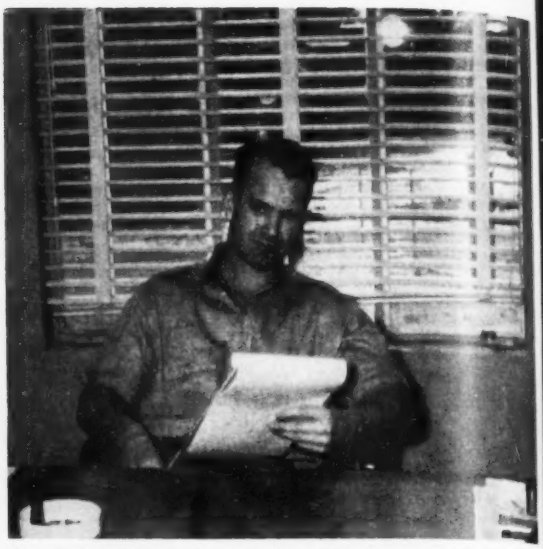
Proved By 2,000,000 Tons

The Thornton pit is now down to its 3,600 bench and will eventually go to the 3,400 bench. Since the present main haulage level (the 600-foot level in the underground mine) is 3,360 feet above sea level, it will be necessary to develop the mine's 850 level for haulage from the north end of the pit. To date, more than 2,000,000 tons have been pulled through the transfer block.

LEFT: Twenty-four-car trolley trains are loaded in three minutes. Three of these trains are used on the 600 level of the Inspiration mine to haul ore to the loading stations at the mine's twin shafts.

RIGHT: Each of Inspiration's twin shafts has a concrete loading station where ore is received and transferred to the automatic skip loaders.

J. R. Sweet, vice president and general manager; formerly from Climax, Colorado, and Luanshya in the Copper Belt of Northern Rhodesia.



Benton B. Bailey, assistant to the general manager; formerly from Colville, Washington, and Gouverneur, New York.

A. M. "Arkie" Szynklewski, chief engineer; formerly from Socorro, New Mexico; Park City, Utah; Rico, Colorado; Leadville, Colorado.

Tungsten's Key Miners

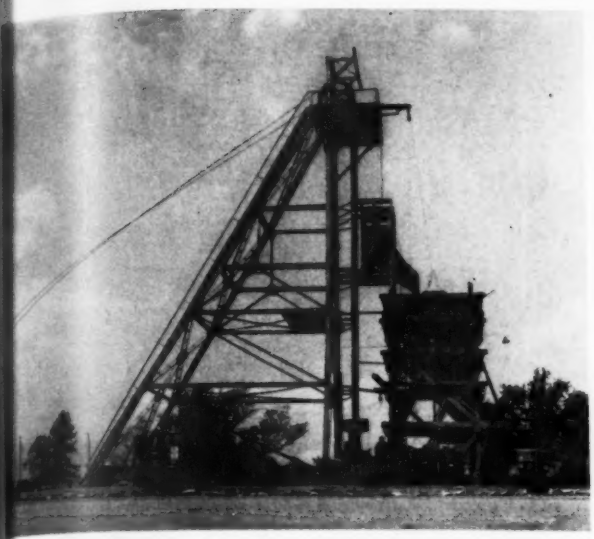
Wherever you see two mining men meet—in San Francisco, Luanshya, Butte, or Tonopah—you are not surprised if they know one another from a time long gone by—in a mining camp far distant. So it is at Henderson, North Carolina.

The key men at Henderson have worked all parts of the world. And they have mined for a variety of metals and minerals which include copper, lead, zinc, gold, silver and talc.

But they have several things in common: They are professional mine-management and -operations men . . . all with man-years of experience. And much of their experience has been in connection with underground mining of vein or bedded ores.

J. C. "Buck" O'Donnell, mine superintendent; formerly from Butte, Montana, and Grass Valley, California.

E. H. Roberts, mine foreman; formerly from Oatman, Arizona; Juneau, Alaska; Climax, Colorado; and Nevada City, California.



Central shaft deepened and improved. Utah Construction Company is sinking it below the 1,500 level. This will open up four new levels.

More stopes, being opened like this, will allow for sustained production at the new rate. Method is fully explained in sequence drawing.

HAMME MINE DOUBLES PRODUCTIVE CAPACITY . .

. . Through more levels operated over a greater strike length on veins and through two deepened vertical shafts reaching 1,500-foot depth

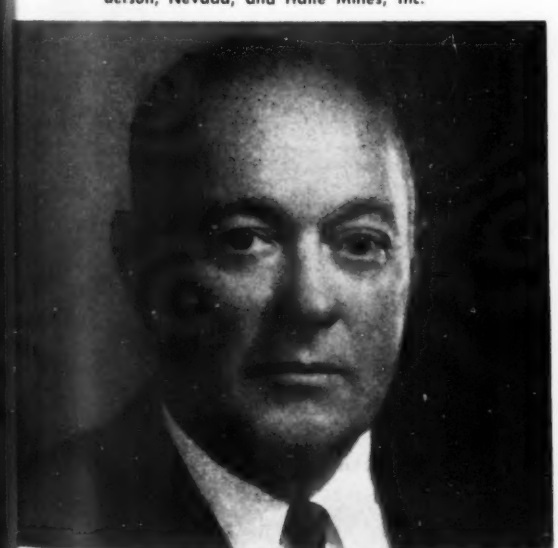
By Howard L. Waldron
New York District Manager
MINING WORLD

In December 1952, Tungsten Mining Corporation's production first rose to slightly over 10,000 units of tungstic oxide (WO_3), per month. And now, according to J. R. Sweet, vice president and general manager, "we are producing in excess of 10,000 units a month."

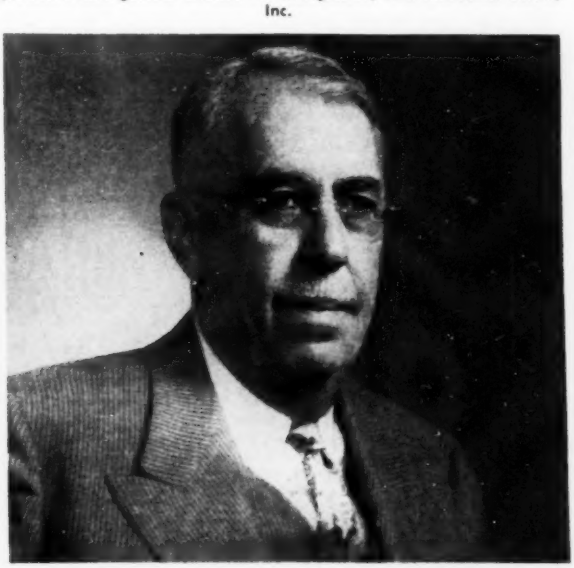
At the corporation's Hamme mine 16 miles north of Henderson, North Carolina, the doubling of production has meant expansion—downward and along the veins. In this expansion, the mine is being operated and developed through its two vertical shafts.

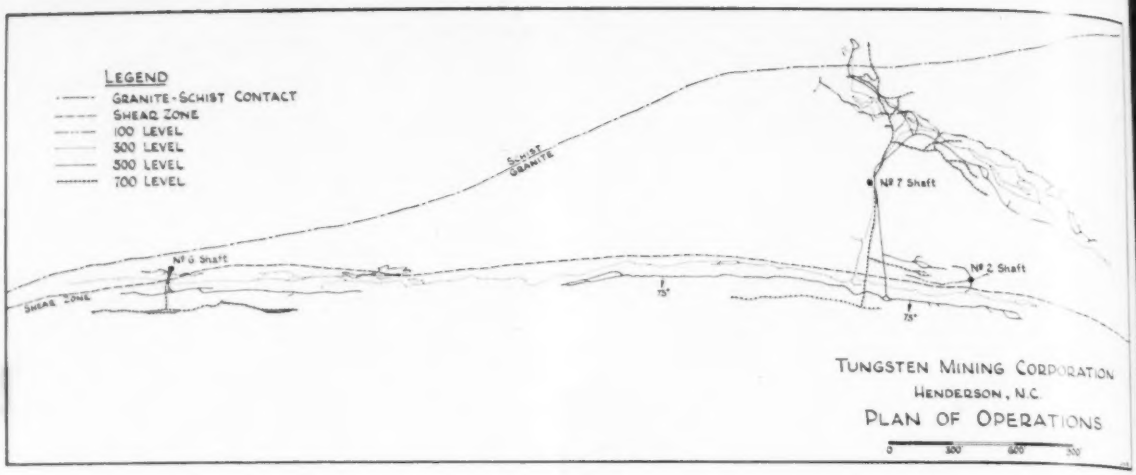
The Central (No. 7) shaft and the Sneed (No. 6) shaft are about 3,375 feet apart; Utah Construction Company is now sinking both shafts to below the 1,500-foot level. Since the deepest operating level has been the 700, the added depth will allow development of four more levels—the 900, 1,100, 1,300, and the 1,500.

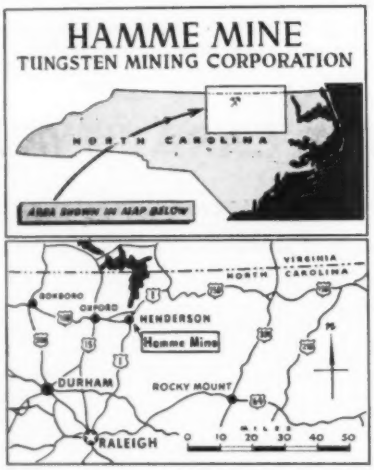
Hewitt S. West, president; also president of Manganese, Inc. at Henderson, Nevada, and Haile Mines, Inc.



W. Lunsford Long, vice president and general counsel; also vice president and general counsel for Manganese, Inc. and Haile Mines, Inc.







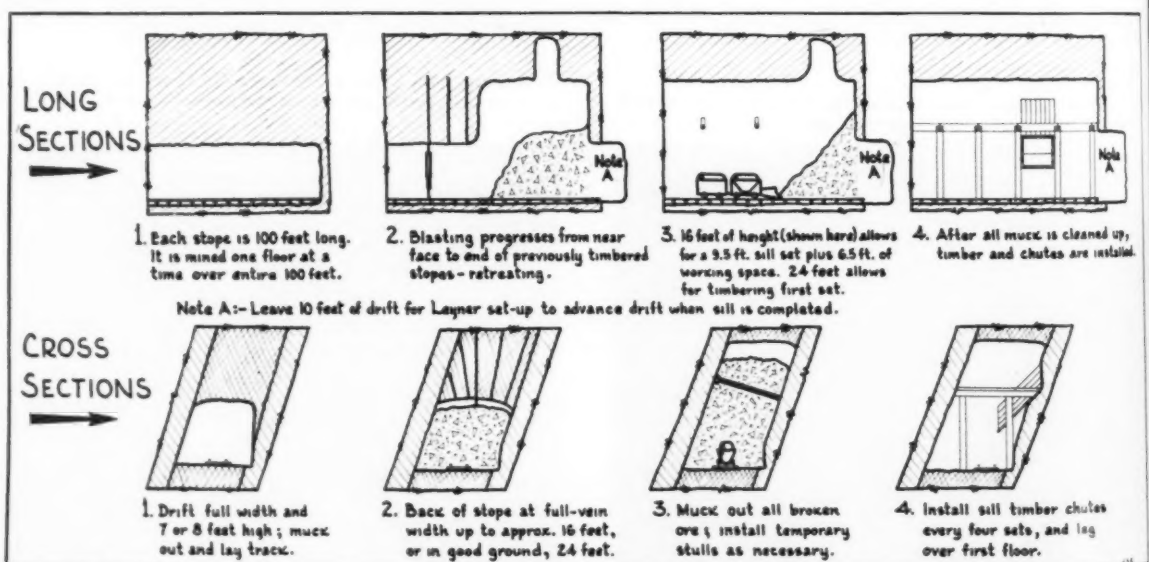
Level development is conducted from both shafts along the strike of the major mineralized zone, northward and southward from the shafts and over the 3,400 feet of strike distance between them. The two shafts are connected on the 300 level and the lower levels will probably likewise be connected due to the normal development of lenses of ore along the strike.

The expanded program of shaft and level development, with the opening of new stopes, has geared the mine for a long-term production at 800 tons per day, six days per week.

It has been just 11 years since two prospectors discovered what is now Hamme mine.

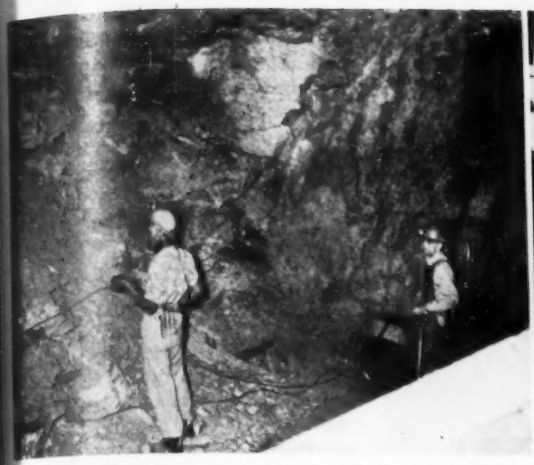
Until World War II started Joseph and Richard Hamme had been hunting mainly for gold. About that time, they talked to their old friend W. Lunsford Long (now vice president and general counsel of Tungsten Mining Corporation). Mr. Long advised them to forget gold for a while and to look for strategic metals or minerals.

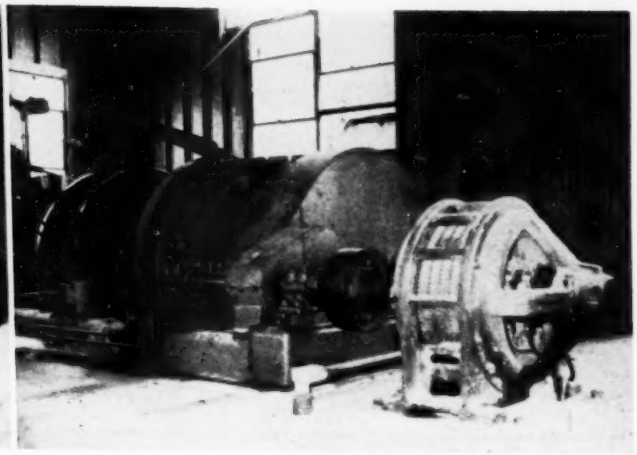
Early in 1942, in the hills 16 miles north of Henderson, the two brothers found a vein of white quartz speckled with a black heavy mineral. They sent specimens to their brother John (now mill superintendent). John identified these specimens as "huebnerite in quartz" and, on the basis of assays, he told Joseph and Richard that if they had even a moderate orebody they had a mine.


LONG SECTIONS
Note A
1. Each stope is 100 feet long. It is mined one floor at a time over entire 100 feet.
2. Blasting progresses from near face to end of previously timbered stopes - retreating.
3. 16 feet of height (shown here) allows for a 9.5 ft. sill set plus 6.5 ft. of working space. 24 feet allows for timbering first set.
4. After all muck is cleaned up, timber and chutes are installed.
Note A:- Leave 10 feet of drift for Layner set-up to advance drift when sill is completed.
CROSS SECTIONS
1. Drift full width and 7 or 8 feet high; muck out and lay track.
2. Back of stope at full-vein width up to approx. 16 feet, or in good ground, 24 feet.
3. Muck out all broken ore; install temporary stulls as necessary.
4. Install sill timber chutes every four sets, and lag over first floor.

TYPICAL METHOD OF STOPE DEVELOPMENT FOR VEIN 9 FEET WIDE OR LESS

HENDERSON, NORTH CAROLINA 1953





LEFT: Cross-slushing brings ore to chutes in wide veins. Here two miners are rigging a tail block to bring ore to the chute in front of the slusher. RIGHT: At No. 6 shaft, this new Vulcan-Denver FD-100 double-drum hoist will allow for increased production. Drums are 54 inch diameter and 42 inches long.

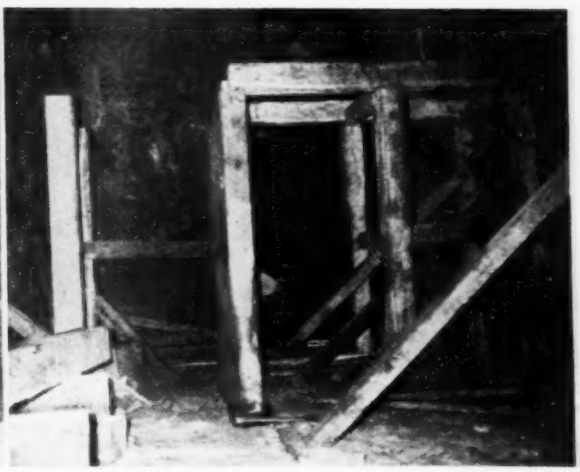
The Hamme brothers acquired the property, developed the mine as an open pit, and built a small gravity mill. But the mine needed more capital than they had. In 1943, they sold out to Haile Mines, Inc.

During the next few years, Haile continued to explore the property and tested ore on a pilot-plant basis. In June of 1945, Haile formed Tungsten Mining Corporation, which acquired from Haile the company's North Carolina tungsten properties and from the General Electric Company its tungsten properties in Idaho and Arizona. Haile Mines received approximately 70 percent of the stock and General Electric 30 percent.

The development of the mine was begun and a 300-ton-per-day mill was built. Production started in 1946 and was increased each year reach-

Miner Bobbie Wilson (left) gets a lesson in airleg drilling drifting from J. E. Davis, representative of Copco Eastern, Ltd. They are testing an Atlas Diesel No. 754-1W drill. Bobbie says, "they sure beat the column mount I was using before."

LEFT: Eugene Hargrove mucks out the ore broken in silling out 7-20-1 drift. He loads the ore from the sill-cut broken to a height of 20 feet to start this stope in a vein averaging 8 to 9 feet wide. RIGHT: Simple, unframed sets of oak timber are used. The set is 5-foot square; 8 feet 8 inches high, including an 8-foot post and an 8-inch thickness of cap. This vein in stope 7-5-32 is six sets wide in places and has been developed for 700 feet of strike length.



TOP: In starting a stope in this 20-foot-wide vein, drift crews drive the drift, lay track, widen on both sides, and break to a 16-foot height. Here, Robert LeMay loads out a string of Card 28-cubic-foot cars with an Eimco 12-B. CENTER: This Mancha little trammer pushes a 10-car string back into a development heading. On production levels, larger "electric mules" haul up to 18 cars. BOTTOM: At the station on the 700 level, two men quickly dump a string of 10, Card, 28-cubic-foot, side dump cars. Tungsten Mining has standardized on these cars: they fit the wide variety of conditions in the mine.

ing capacity production in 1949. This capacity rate of production was maintained up to 1952, at which time the production was further increased under the recent expanded program.

This expansion brought mine and mill capacity to 600 tons per day (and actual throughput to 700 tons per day, for seven days per week).

Black-and-White Ore

The huebnerite-quartz veins at Hamme mine are hard and firm. The country rock is a firm granite. However, the overall structure surrounding the veins is sheared, and the walls require support as stoping advances. Otherwise, excess waste dilution would result. The hanging wall and footwall are generally clearly defined.

The two important veins at Hamme mine form a "V" with the point toward north. (See aerial plan view.) They dip easterly at a consistent 70 to 80 degrees.

The veins at Hamme mine take the form of long, high lenses which pinch out at thrust points in the vein-forming fissure. They vary from zero width to about 40 feet in width at the widest point. Change of width is gradual: one 25-foot-average vein, has a strike length of over 700 feet to date. "It was, and is," as chief engineer A. M. Szynklewski says, "a mine in itself."

The Central shaft was so named because it is in a central area, between the "V" formed by the two veins. Because it is near the mill and both veins are mined from it, the Central is and will continue to be the main production shaft.

Both shafts have three compartments down to the 850 level; both will have 3½ compartments from there to below the 1,500 level. Utah Construction Company is sinking both simultaneously, and is using a Riddell mucker in each.

Flat-Back Stopes

The flat-back square-set system is standard throughout the mine. Each stope is 100 feet along the vein, 200 feet high, and full-vein width. Two slightly different systems of stope development are used—one for veins under 9 feet wide, and one for veins over 9 feet wide.

The system of stope development opens up a rather large horizontal area (size depends on vein width) for a vertical height of 16 feet. If immediate support of the walls is required, temporary stulls are placed.

(*Continued on page 67*)

The Toho Aen Mining Company, Ltd.'s Annaka smelter in Ibaragi Ken, Japan, which produces electrolytic lead. A new zinc-concentrate roasting unit, an electrolytic zinc plant, and a sulphuric acid plant have recently been placed in operation.

TOHO AEN COMPANY ENLARGES JAPANESE LEAD ZINC SMELTER, ADDS SULPHURIC ACID PLANT

The Toho Aen Mining Company, Ltd. has recently completed an expansion program at its smelters in Japan under the direction of Michisuke Aikawa, company president. The company, one of the largest lead and zinc producers in Japan, is now producing electrolytic lead, electrolytic zinc, and sulphuric acid.

Remodel Copper Smelter

The first step in the program was the purchase and remodeling of the old Chikirishima copper smelter in Hiroshima Prefecture. The smelter was operated during World War II by the Teikoku Kohatsu Mining Company, Ltd. The Toho Aen company repaired and remodeled the smelter to produce pig lead from 48 percent lead concentrate. A roaster, six sintering machines, and a lead blast furnace were installed during the remodelling program. Smelter capacity is 20 tons of pig lead per day, but it has only been producing about 160 tons per month from the smelting of 380 tons of concentrate. Pig lead is shipped to the company's Annaka smelter in Ibaragi Prefecture, where electrolytic lead is produced.

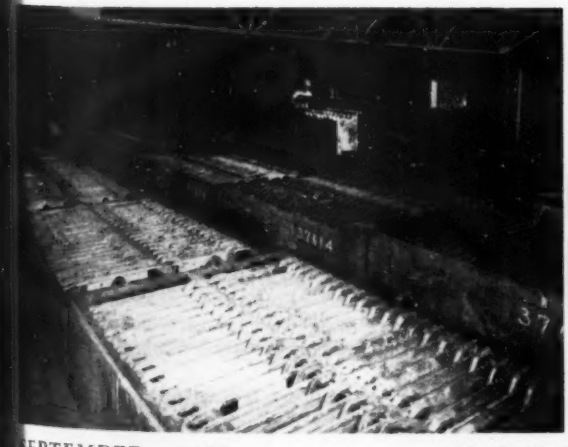
Annaka Smelter Enlarged

The company has completed a zinc-concentrate roasting plant and a sulphuric acid plant at its Annaka smelter. A rotary drier, two Wedge roasters, a 15-kva Cottrell plant and a sulphuric acid plant were added. The acid plant uses SO_2 gas from the roasters and has a capacity of 50 tons of 50° Baumé sulphuric acid daily. The plant is currently treating 50 percent zinc concentrate and is producing 500 tons of electrolytic zinc and 1,200 tons of sulphuric acid monthly.

Concentrates From Tsushima

The lead and zinc concentrates are produced at the company's differential flotation mill at the Taishu mine on Tsushima Island, Nagasaki Prefecture. Tsushima is the large island in the Korea Strait between Korea and Kyushu, Japan's most southerly island.

LEFT: Interior view of the electrolytic-lead cells in the Annaka smelter. RIGHT: The new zinc-concentrate roasting and sulphuric acid plants at the Annaka smelter are housed in these buildings. At left are two waste gas purifying towers, a 15 kva Cottrell plant, and the roaster building (far right).



PART II

This new flotation mill near Parral, Chihuahua, Mexico, was built by Minas de Iguala S. A., a subsidiary of The Eagle-Picher Company, to concentrate the lead-zinc sulphide ore from the company's Esmeralda mine. It is also equipped to handle custom ores from the many small producers near Parral.

MINAS de IGUALA'S 1,000-TON-PER-DAY MILL AT PARRAL TREATS ESMERALDA LEAD-ZINC ORE

By Robert L. Burns
Field Editor
MINING WORLD
San Francisco, California

Minas de Iguala, S.A., a subsidiary of The Eagle-Picher Company of Miami, Oklahoma, is now operating at full capacity its new 1,000-ton lead-zinc flotation mill at the Esmeralda mine near Parral, Chihuahua, Mexico. The plant was erected when underground exploration corroborated evidence from surface drilling that had indicated the existence of a mineralized area carrying lead and zinc sulphides of mineable grade and extent. (See MINING WORLD, August 1953.)

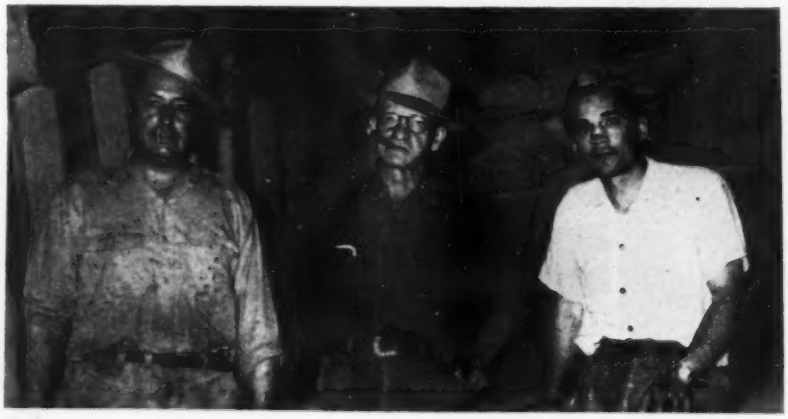
Mine and mill operations are under the supervision of H. T. Blackwood, general manager, and Vincente Cisneros, general superintendent. Milling is directed by C. V. Irving, mill superintendent, with the assistance of Jose Sandoval and Ignacio Hinojos. Most of the Minas de Iguala staff was formerly at the Eagle-Picher operations in Taxco, Mexico.

Company and Custom Ore

The mill is equipped to handle not only Esmeralda ore but also custom ore from the many small properties near Parral. Custom ore is segregated in open bins near the mine headframe and after sampling, it is loaded into a skip that hoists it to the top of a special headframe ore bin made of cribbed 2- by 12-inch lagging. This bin is made in two compartments; one, about two-thirds of the total bin volume, handles custom ore, and the other provides temporary storage for waste rock produced in shaft sinking and development. The waste rock section is equipped with a chute and air-powered gate from which the material is loaded into trucks for disposal. Custom ores are fed to the surface crusher system that handles Esmeralda ore.

Broken mine ore is crushed underground in a 24- by 36-inch Rogers Iron Works jaw crusher installed on the 1,000 level of the Esmeralda mine. Hoisted ore is dumped into a 440-ton steel head-frame bin erected by the Ozark Engineering Company. From here it is plate fed by an 18-inch Rogers unit to a 6-rod Rogers grizzly with two-inch openings. Oversize is crushed in a 12- by 24-inch Rogers jaw crusher and rejoins the undersize on a 20-inch conveyor that feeds to the secondary crushing plant. Tramp iron is removed from the circuit at this point by a Stearns Magnetic Company magnetic head pulley.

Esmeralda milling is under the supervision of Jose Sandoval (left), assistant mill superintendent; C. V. Irving, mill superintendent; and Ignacio Hinojos, assistant mill superintendent.



Number, Horsepower, Manufacturer, and Use for Electric Motors in the 1,000-Ton-Per-Day Esmeralda Lead-Zinc Mill at Parral, Mexico

Number	Horsepower	Manufacturer	Use
1	7.5	Louis Allis	Coarse ore feeder
1	3	General Electric	Vibrating grizzly
1	40	Westinghouse	Jaw crusher
1	3	General Electric	Conveyor between crushers
1	3	Reuland Electric	Vibrating screen
1	60	Westinghouse	Cone crusher
1	15	General Electric	Fine ore conveyor
4	½, ½, ¼, 3		Automatic sampler
1	7.5		Mobile conveyor
3	1	General Electric	Feedoweights
3	250	General Electric	Ball mills
3	75	Westinghouse	Classifiers
3	2	Reliance	Classifiers
2	30	General Electric	Pb roughers
1	30	General Electric	Pb scavengers
1	30	General Electric	Second Pb cleaner circuit
1	5	General Electric	First Pb cleaner circuit
1	2	General Electric	Pb thickener
1	3	General Electric	Zn concentrate conveyors
2	15, ½	General Electric	Zn conditioner
2	30	General Electric	Zn roughers
3	30	General Electric	Zn scavengers & cleaners
1	2	General Electric	Small thickener in Zn circuit
1	20	General Electric	Small ball mill in Zn circuit
1	2	Westinghouse	Small classifier in Zn circuit
1	3	Century	Zn concentrate thickener
1	15	General Electric	Filter shaft, rotary pump, and three diaphragm pumps.
2	3	General Electric	Zn concentrate conveyors
1	25	Houston	Tailing disposal
1	40	Houston	Vacuum pumps
3	2		Diaphragm pumps
4	5	General Electric	Centrifugal pumps in Pb circuit
4	7.5	General Electric	Centrifugal pumps in Zn circuit
1	40	General Electric	Make-up water pumps

These six Fagergren flotation cells form the lead rougher and scavenger circuits. Tailing from the scavengers is conditioned in the tank in the background before zinc separation.

Before further reduction, the ore stream is separated at ¾ inch by a 5- by 5-foot Stephens-Adamson screen. The coarse fraction is crushed in a 3-foot Symons Standard cone-crusher and added to the fines on a 20-inch belt conveyor. A Merrick Weightometer on this conveyor installation is used to check accurately mine tonnages and mill feed—especially important, of course, with custom ore.

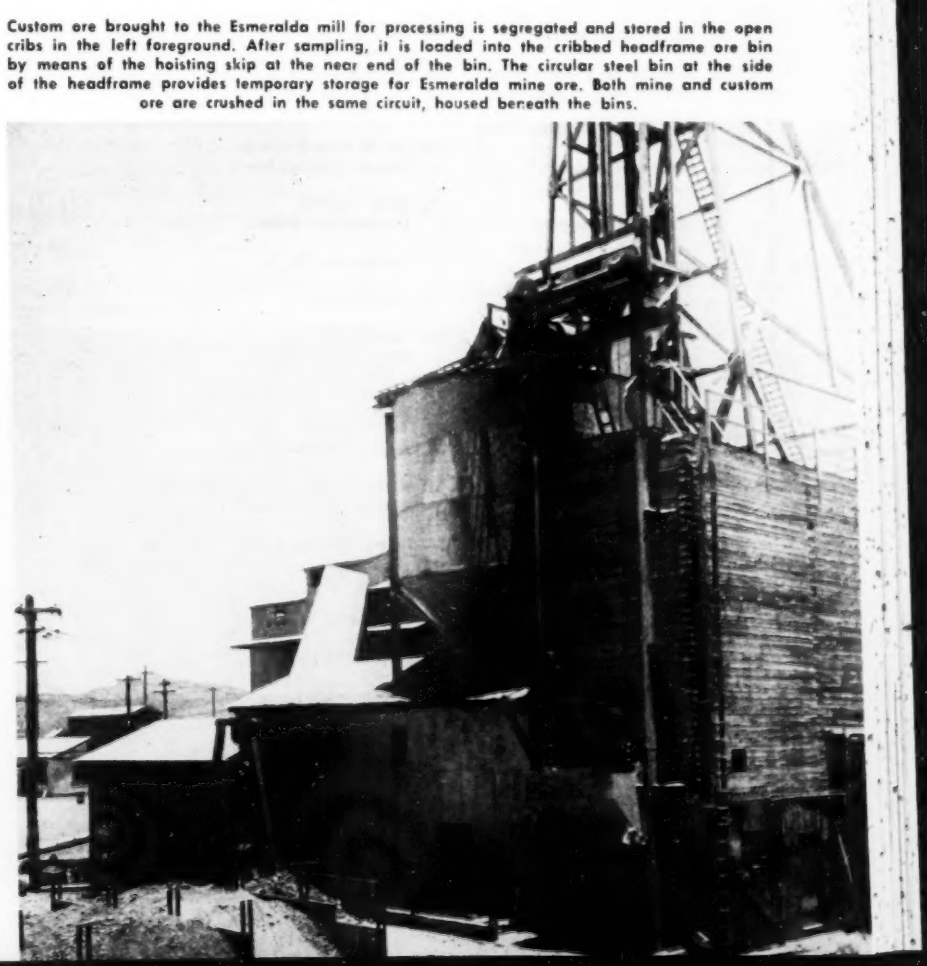
Belt discharge, cut intermittently by a Colorado Iron Works automatic sampler, falls to a shuttle conveyor that feeds three 440-ton Ozark fine-ore bins. The rate of discharge from each of these bins is controlled by a Merrick Feedoweight to insure maximum efficiency in grinding.

Lead Flotation

The grinding section, where sodium cyanide, zinc sulphate, and soda ash are added to condition the pulp for lead flotation, is made up of three Marcy No. 75 ball mills operating in closed circuit with three Akins 66-inch simplex spiral classifiers. For further lead conditioning, Reagent 301, methyl isobutyl carbinol, and zinc sulphate are added to the combined overflow from the classifiers as it is fed to a lead rougher circuit made up of four 5-inch Fagergren flotation cells. Rougher concentrate is treated in a cleaner ciruit composed of six Denver "Sub-A" No. 24 cells where more zinc sulphate is added to insure sphalerite depression. Cleaner concentrate (from the first two of the six cells) is thickened and then filtered in two American disc filters, one three-leaf and one four-leaf.

Cleaner tailing is retreated in a two-cell Fagergren circuit and tailing from this second cleaner joins the rougher feed. Concentrate from the second cleaner returns to the fourth cell in the first cleaner circuit. Lead ougher tailing is scavenged in a two-cell Fagergren circuit where 301 and methyl isobutyl

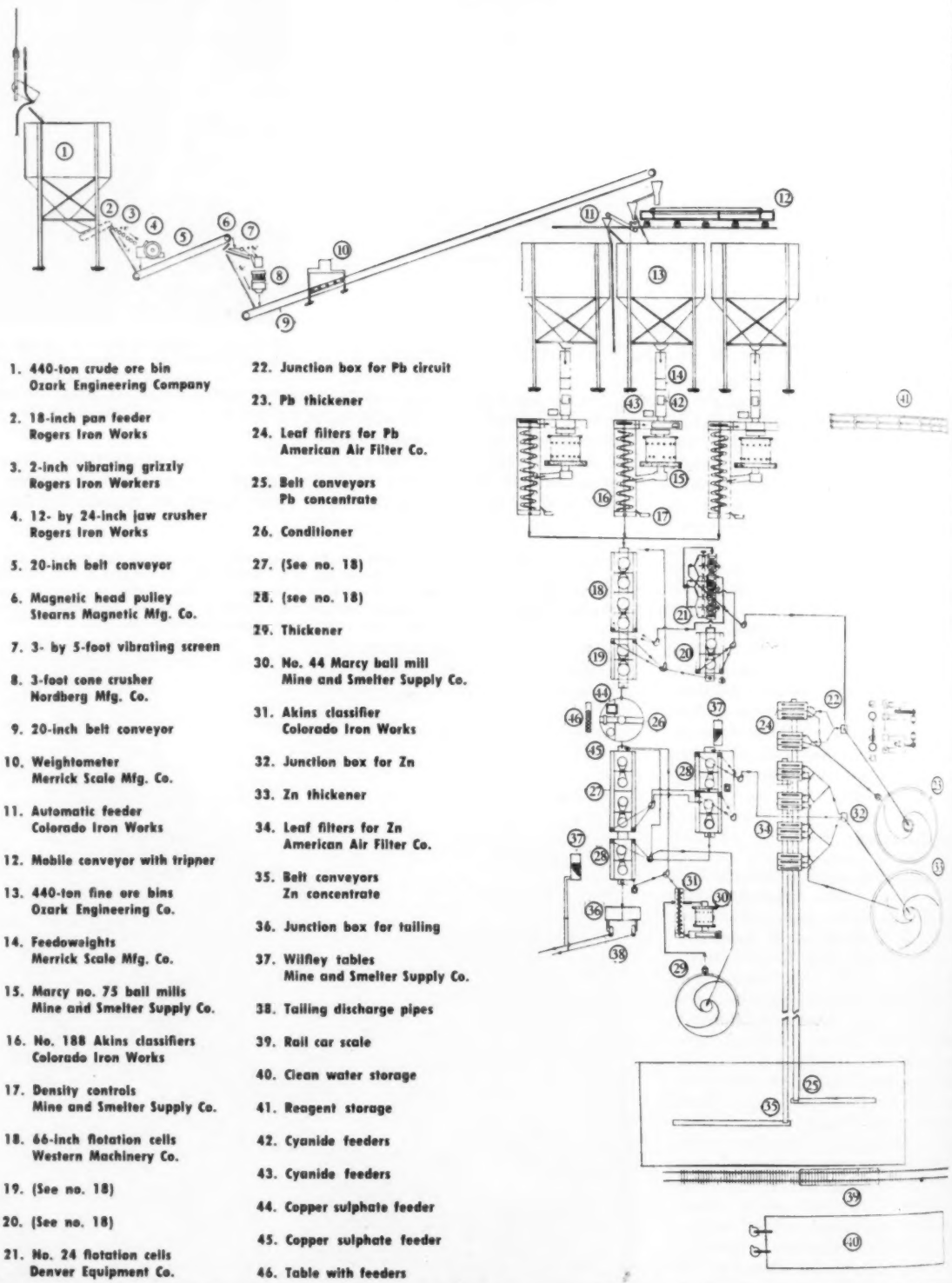
Custom ore brought to the Esmeralda mill for processing is segregated and stored in the open cribs in the left foreground. After sampling, it is loaded into the cribbed headframe ore bin by means of the hoisting skip at the near end of the bin. The circular steel bin at the side of the headframe provides temporary storage for Esmeralda mine ore. Both mine and custom ore are crushed in the same circuit, housed beneath the bins.



FLOWSHEET DE LA PLANTA DE BENEFICIO EN

LA ESMERALDA, MINAS DE IGUALA, S. A.

Parral, Chihuahua, Mexico



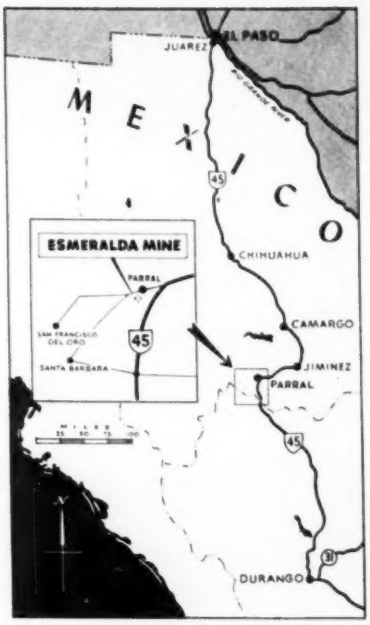
1. 440-ton crude ore bin
   Ozark Engineering Company
2. 18-inch pan feeder
   Rogers Iron Works
3. 2-inch vibrating grizzly
   Rogers Iron Workers
4. 12- by 24-inch jaw crusher
   Rogers Iron Works
5. 20-inch belt conveyor
6. Magnetic head pulley
   Stearns Magnetic Mfg. Co.
7. 3- by 5-foot vibrating screen
8. 3-foot cone crusher
   Nordberg Mfg. Co.
9. 20-inch belt conveyor
10. Weightometer
    Merrick Scale Mfg. Co.
11. Automatic feeder
    Colorado Iron Works
12. Mobile conveyor with tripper
13. 440-ton fine ore bins
    Ozark Engineering Co.
14. Feedoweights
    Merrick Scale Mfg. Co.
15. Marcy no. 75 ball mills
    Mine and Smelter Supply Co.
16. No. 188 Akins classifiers
    Colorado Iron Works
17. Density controls
    Mine and Smelter Supply Co.
18. 66-inch flotation cells
    Western Machinery Co.
19. (See no. 18)
20. (See no. 18)
21. No. 24 flotation cells
    Denver Equipment Co.
22. Junction box for Pb circuit
23. Pb thickener
24. Leaf filters for Pb
    American Air Filter Co.
25. Belt conveyors
    Pb concentrate
26. Conditioner
27. (See no. 18)
28. (see no. 18)
29. Thickener
30. No. 44 Marcy ball mill
    Mine and Smelter Supply Co.
31. Akins classifier
    Colorado Iron Works
32. Junction box for Zn
33. Zn thickener
34. Leaf filters for Zn
    American Air Filter Co.
35. Belt conveyors
    Zn concentrate
36. Junction box for tailing
37. Wilfley tables
    Mine and Smelter Supply Co.
38. Tailing discharge pipes
39. Rail car scale
40. Clean water storage
41. Reagent storage
42. Cyanide feeders
43. Cyanide feeders
44. Copper sulphate feeder
45. Copper sulphate feeder
46. Table with feeders

Number, Type, Manufacturer, and Use for Pumps in the 1,000-Ton-Per-Day Esmeralda Lead-Zinc Flotation Mill, Parral, Mexico

Number	Type	Manufacturer	Use
1	Rotary	P. H. & F. M. Roots Co.	Air to filters
1	Centrifugal	A. R. Wilfley & Sons	Tailing disposal
2	Vacuum	Ingersoll Rand Co.	Filters
1	Diaphragm	Butchart Joplin	Pb filter water
1	Diaphragm	Butchart Joplin	Zn filter water
1	Diaphragm	Butchart Joplin	Zn cleaner circuit
1	Diaphragm	Butchart Joplin	Pulp to Pb filters
1	Diaphragm	Butchart Joplin	Zn scavenger circuit
1	Diaphragm	Butchart Joplin	Feed to Zn circuit ball mill
1	Diaphragm	Butchart Joplin	Second Pb cleaner circuit
4	Centrifugal	A. R. Wilfley & Sons	Pb flotation circuit
4	Centrifugal	A. R. Wilfley & Sons	Zn flotation circuit
2	Centrifugal	American Marsh Pumps, Inc.	Make-up water supply

Flotation Reagents Used at 1,000-Ton-Per-Day Esmeralda Lead-Zinc Mill According to Type, Consumption in Pounds Per Ton of Ore Treated, and Point of Addition

Reagent	Pounds Consumption Per Ton Ore Treated	Point of Addition
Sodium cyanide	0.110	Ball mills
Zinc sulphate	0.376	Ball mills
Soda ash	0.152	Ball mills
Reagent 301	0.046	Lead rougher and scavenger cells
Methyl isobutyl carbinol	0.048	Lead rougher and scavenger cells
Zinc sulphate	0.188	Lead rougher and cleaner cells
Copper sulphate	1.030	Zinc conditioner
Sodium Aerofloat	0.086	Zinc conditioner
Lime	1.623	Zinc conditioner and cleaner cells
Sodium Aerofloat	0.093	Zinc rougher cells
Aerofloat 25	0.012	Zinc scavenger cell
Reagent 301	0.004	Zinc scavenger cell



enged in a two-cell Fagergren circuit where 301 and methyl isobutyl carbinol are again added. Scavenger concentrate returns to rougher feed and tailing flows to a zinc conditioner where lime, copper sulphate, and sodium Aerofloat are added.

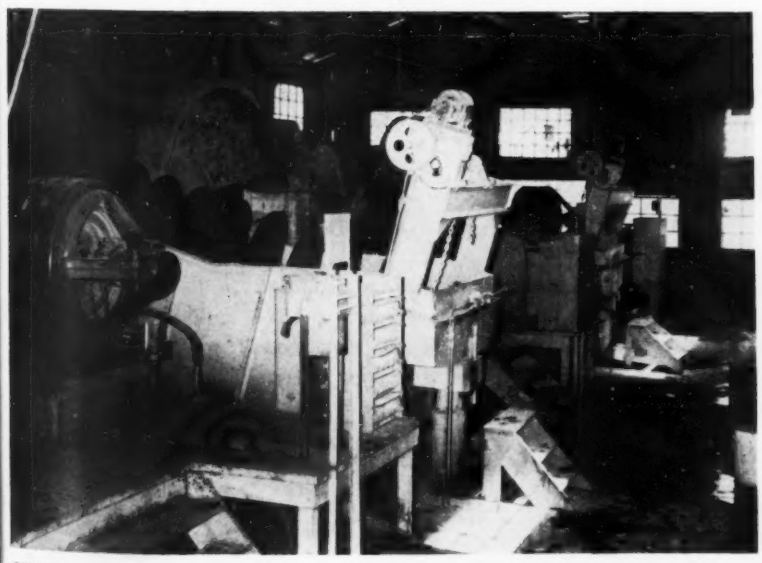
Zinc Flotation

The zinc rougher and scavenger circuits are similar to those in the lead section. The zinc cleaning circuit, however, is composed of four 66-inch Fagergren cells. Tailing from the cleaner joins scavenger concentrate for regrind treatment using an 18-foot thickener and a Marcy No. 44 ball mill operating in closed circuit with a 24-inch Akins simplex spiral classifier. Classifier overflow returns to zinc rougher feed.

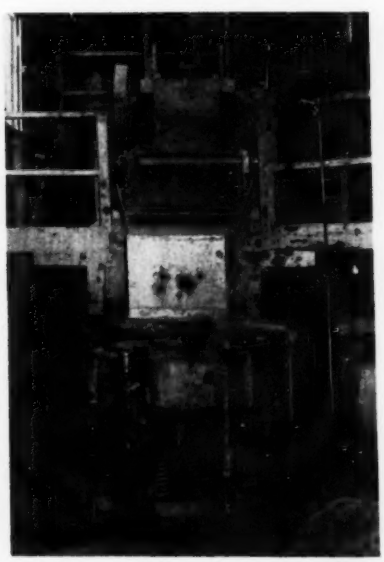
Tailing from the zinc section is handled by a 4-inch Wilfley pump to a dry tailing dump. Two Wilfley pilot tables are used to observe zinc concentrates and final tailing. Tables are fed with a continuous sample taken from Wilfley pumps handling these products. Automatic sampling (Butchart Automatic Sampler) is used on the overflow from the three Akins classifiers of the grinding circuit and on the final tailing.

Zinc concentrate is dewatered in a thickener and filtered by four three-leaf American filters. Both the zinc and the lead concentrates drop to two belt conveyors that lead to the "patio," the temporary storage shed along the spur line from the Mexican National Railroad that services the mine and mill.

Esmeralda's grinding section is composed of three Marcy 75 ball mills operating in closed circuit with three Akins simplex spiral classifiers.



The in-line primary and secondary crushing units include a Rogers Iron Works Live Roll grizzly, a Rogers jaw crusher, a vibrating screen, and (in the foreground) a 3-foot standard Symons cone crusher.



DOW

CUT FLOTATION COSTS WITH DOW XANTHATES

Superior collectors increase profits by providing greater recovery, higher concentrate grade of sulfides

With Xanthates on the job every bubble is loaded to capacity, increasing your recovery and raising your concentrate grade. Because of their greater efficiency in fast, complete separation of the sulfide minerals, Dow Xanthates save you money.

For more efficient differential flotation, Dow offers a wide range of Xanthates of extremely selective collector power. Since all of these collectors are essentially nonfrothing, the operator enjoys complete freedom to regulate the frother and the collector independently.

For further information and test samples of Dow Xanthates, write to THE DOW CHEMICAL COMPANY, Midland, Michigan, Dept. OC 3-48.

NEW SUPPLEMENT AVAILABLE FOR YOUR FLOTATION INDEX

Our 23rd Annual Addition to the DOW Flotation Index, most authoritative guide to published material on the flotation process, is now ready. Write for your copy today.

you can depend on DOW CHEMICALS

DOW

Golden Anniversary offices of the Idaho Mining Association elected at the Association's 50th convention are: (left to right) R. D. Leisk, president; Harry W. Marsh, secretary; P. C. Fedderson, director; Oscar W. Worthwine, director; and E. B. Douglas, director. Elected officers not pictured are: L. E. Traeger, vice president; Ralph Neyman and Joseph C. Kieffer, directors. Mr. Leisk is general manager of the Sunshine Mining Company, and Harry W. Marsh is the long-time association secretary. P. C. Fedderson is smelter superintendent for the Bunker Hill & Sullivan Mining and Concentrating Company. Oscar Worthwine is a Boise mining attorney. L. E. Traeger is superintendent of Anaconda Copper Mining Company's Conda phosphate operations. Ralph Neyman is general manager of the Hecla Mining Company, and J. C. Kieffer is assistant manager, Northwest Mining Department, American Smelting and Refining Company.

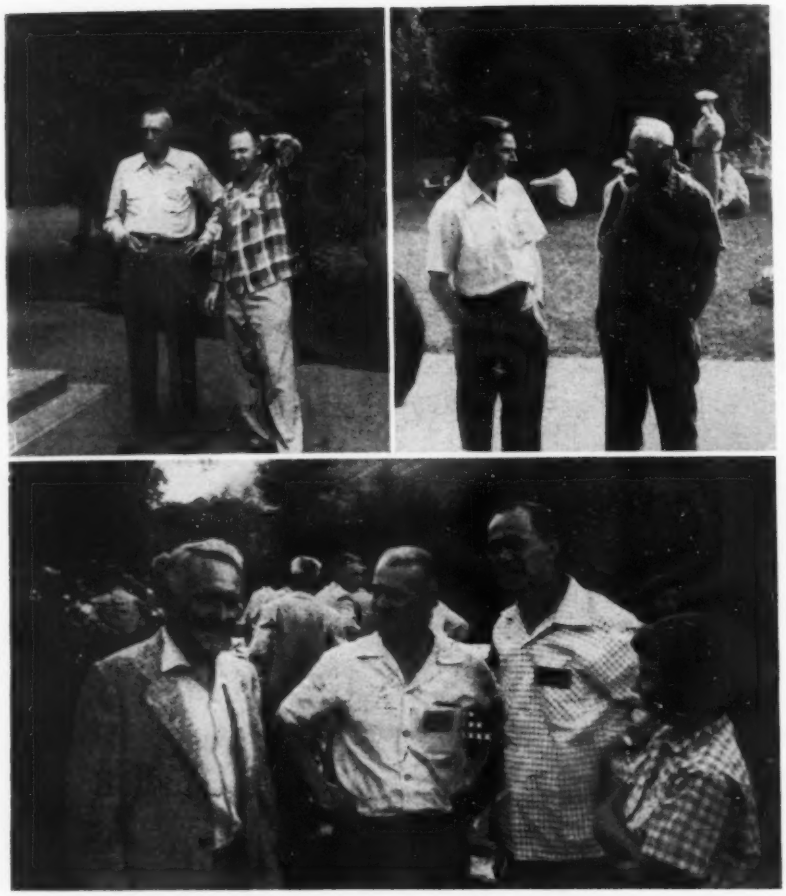
IDAHO MINING ASSOCIATION CELEBRATES IT'S 50th ANNIVERSARY OF SERVICE TO INDUSTRY

"Idaho mining is a thing of permanence" said Stanley Easton, president of Idaho's largest mining company—the Bunker Hill & Sullivan Mining and Concentrating Company, in opening the Golden Anniversary meeting of the Idaho Mining Association. He spoke with authority as he has been a leading member of the association since he helped found it on May 23, 1902 to honor President Theodore Roosevelt's visit to the Coeur d'Alene district mines. The well-attended meeting was held at Sun Valley, Idaho from July 13th through the 16th and featured outstanding technical papers as well as famous western recreational facilities.

Mineral Secretary's Views

In his first mining policy speech since assuming office as Assistant Secretary of the Interior Department for mineral resources, Felix E. Wormser stated that his position was a challenge "to do all I can to foster the development of our mineral resources, within our great tradition of free enterprise." However,

LEFT: The Snake River Subsection of the AIME holds a noon luncheon as part of the convention's social activity. RIGHT: The traditional group photograph of all those in attendance was taken in front of the Sun Valley Opera House on the first day of the Convention.



TOP LEFT: Ralph W. Neyman (left), general manager, and John R. Matthews, secretary, Hecla Mining Company, Wallace, Idaho talk between two of the technical sessions. TOP RIGHT: Assistant Interior Department Secretary Felix E. Wormser (right) chats informally with L. J. Randall, president, Hecla Mining Company. BOTTOM: Fred Varney (left, from far-off Mindanao, Philippine Islands, came the farthest but was closest to home for the convention. Before going to the Islands, he was superintendent for the Minnie Moore mine at nearby Bellevue, Idaho. Robert B. Austin (center), Coeur d'Alene Hardware & Foundry Company, Wallace, and C. C. Livingston, mine superintendent, Triumph Mining Company, welcome him back to Idaho.

he cautioned, it is futile to think that the system of more and more regulation will change suddenly. He than advised the mining industry to be realistic and to appreciate that "the world is cluttered with devices of government."

Governmental developments in the last 20 years cited by Secretary Wormser as affecting the mining industry are: "(1) Almost complete abolition of tariff protection for some metals and minerals. (2) Control over the issue of mine securities. (3) The imposition of high income taxes, both corporation and personal, also a capital gains tax. (4) Use of substantial funds from the Treasury to support mining at home and abroad, largely in the interest of defense. (5) Use of international allocations, such as the International Materials Conference, participation in the International Tin Commodity Conference, or the suggestion of the Paley Commission that international commodity agreements might be of help to the mining industry. (6) Tendency of many foreign governments to use managed currencies rather than currencies tied to gold."

Getting down to specific cases, Secretary Wormser then said that the mining industry has an immediate problem. "I believe there is an obligation on government's part to provide some kind of assistance, especially since it is essential to maintain the strength we have gained through the mobilization effort. . . . What type of assistance is desirable?" he asked. One of several things can be done starting with letting the industry alone, granting tariff relief, granting subsidies, or setting up buffer stocks and international commodity agreements, he believes.

Idaho has been particularly fortunate under the program of the Defense Minerals Exploration Administration with the fine participation of the mining interests in the state. Specifically, "Idaho ranks first in the number of contracts in force; first in the total dollar value of projects approved for any one state, first in the variety of projects approved, and first in the highest percentage of cases acted upon."

As for a long-range mining policy, the Secretary had no idea along what lines it might evolve, but he reassured the mining industry that the Department of Interior and the President were aware of the problems of the metal and mineral producers of the west. In conclusion he promised to do all he could to institute a Cabinet—level study of the problems facing the domestic mining industry.

What Is Miner's Pay?

W. T. Simonds, president, and Malcolm C. Brown, general manager of the Sidney Mining Company, Kellogg, Idaho, reported on the Coeur d'Alene's *hidden payroll*. Mr. Brown read the report and asked, "How much do you pay for a stope miner these days?" The probable answer would be $13.54 per shift. To get the true answer, they queried 19 of the district's operators in regard to their "fringe benefits"—items like holiday pay, vacation pay, various insurance and similar non-wage costs. For the year 1952 their compilation showed that an average of 4,349 employees received total direct wage payments of $19,326,929, or an average daily wage of $15.94 in the district. As for non-wage payments, miners received $0.763 per shift for social security, unemployment compensation, workmen's compensation, and hospital coverage. Also paid was $0.470 per shift to cover pension costs, non-occupational insurance, and group life insurance. Payments for time not worked amounted to $0.494 per shift covering vacation and holiday pay. Miscellaneous fringe items including transportation and social contributions amounted to $0.16 per shift. The authors commented, "Especially noteworthy is the payment for time not worked." The paid lunch period was not included in this category, nor was clean-up and travel time. They estimated these would amount to an additional cost of five cents per hour or three percent of the payroll. In answer to the question about miner's pay, it is really $17.83 per shift, and there is $4.29 per shift

or $0.53 cents per hour that is not readily apparent.

Lead Looks Up

Lead miners in Idaho, the nation's second largest lead producing state, are always interested in the lead market. The lead situation was summarized—both long and short range—to the satisfaction of all concerned as price increases and growing uses were both predicted. In a speech on "Some Long Range Aspects of Consumption of Silver, Lead, and Zinc," Simon D. Strauss, vice president of the American Smelting and Refining Company, said that the consumption of newly mined lead in the United States had increased 70 percent in the last 15 years and that the country was in a period of dynamic industrial growth which meant new and increasing uses for lead. He added, "As long as this country will continue to put a premium on inventiveness in science, on improvements in production techniques, and on initiative in economic affairs, still further growth lies ahead."

Robert L. Ziegfeld, secretary, Lead Industries Association, New York, New York, outlined the current lead situation and said that lead consumer business in the United States was at a high level—in fact in the first four months of 1953 27,000 more tons were used than in same period of last year. Another favorable factor is that "excess stocks have been liquidated" and he added, "I don't know of any large stocks of lead anywhere hanging over the market."

New Markets For Zinc

Maintenance of existing markets, ways to expand them, and the search for new uses were seen as the solution to too much zinc and the resultant low price by Ernest V. Gent, executive vice president, American Zinc Institute, Inc., New York, New York. Zinc for cathodic protection of pipe lines, rolled zinc for building uses, and heavier coated zinc sheets offer opportunities to increase the use of zinc, he said.

Radioactive Placer Minerals

The U. S. Bureau of Mines, the United States Geological Survey, and the United States Atomic Energy Commission have all tested and made surveys of the placer deposits containing radioactive minerals in Valley County, Idaho. J. Hoover Macklin, professor of geology at the University of Washington and part-time United States Geological Survey geologist, gave a summary of findings. The chief placer minerals are monazite, and a group of uranium-bearing rare earth columbates and tantalates. Three dredges have recovered monazite in Long Valley, Idaho, and a deposit of monazite and radioactive columbite-tantalites will be mined in the near future, he said.

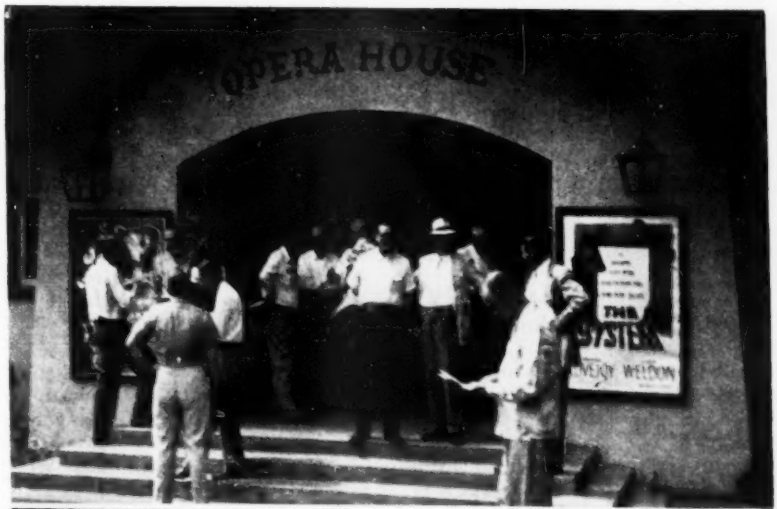
Findings to date indicate that the monazite is a widely distributed accessory mineral in the granitic rock of the Idaho batholith and that radioactive minerals originate in pegmatite dikes which cut the granite.

A. J. Kaufman, Jr., chief, minerals industry division, U. S. Bureau of Mines, Albany, Oregon, summarized the history of rare earth placer dredging in Idaho and predicted that "the richer deposits at Mountain Pass, California may force the shutdown of Idaho dredges." He then emphasized the importance of other minerals in Idaho placer deposits and estimated that they contained 2,782,000 tons of ilmenite, 810,000 tons of garnet, 117,000 tons of zircon, and 18,000 tons of columbite-tantalite. He predicted that these minerals might form the basis for profitable dredging if and when monazite recovery became unprofitable.

Proper Use for Gold

Dr. Donald H. McLaughlin, president, Homestake Mining Company, San Francisco, California, defined the proper use of gold to be "the final base of reference for all the devices by which value in terms of money is expressed." He said that "it would seem more accurate to an economist to say that gold is the only commodity universally accepted as money." Quoting Philip

TOP: Gold is the item under discussion as this group waits for the technical sessions to start. BOTTOM: The cocktail party sponsored by the officers and directors of the Idaho Mining Association was held on the east lawn of the Challenger Inn.



LEFT: Simon D. Strauss, vice president, American Smelting and Refining Company, talks about lead with Kuno Doerr, Jr., manager of ASARCO's East Helena, Montana lead smelter, and P. C. Fedderson, superintendent, lead smelter of the Bunker Hill & Sullivan Mining and Concentrating Company. RIGHT: Ernest V. Gent, executive vice president, American Zinc Institute, Inc., Robert Ziegfeld, secretary, Lead Industries Association, and Wallace G. Wolff, superintendent, Sullivan Mining Company's electrolytic zinc smelter, pose in front of the Opera House where all meetings were held.

Cortney, president of Coty, Inc. of New York, New York, Dr. McLaughlin emphasized "The time to change the price of gold is not after a depression has set in. Our aim must be to restore monetary order and to prevent a severe and prolonged depression." He added, "The gold mining industry can wholeheartedly support the objectives . . . for the general good that such policies would bring to the entire economy."

As a small step in the right direction, Dr. McLaughlin advocated that "the Administration should be urged (1) to remove the present restrictions on ownership of gold by United States citizens, and (2) to terminate the sale of gold by the Treasury to the so-called industrial users. The first would restore a right to the people that never should have been taken from them. It would give individuals—and companies, too—the right to protect themselves legally against a further depreciation of the dollar."

Mining Tungsten in Korea

Joseph A. Mecia, mining engineer for Utah Construction Company, reported on the progress Utah is making in rehabilitating Korean mines and mills. Utah has a management-type contract with the Republic of Korea, and Mr. Mecia was one of the key technicians sent to that country early this year.

Mr. Mecia defined the goal of the contract as "the placing of the Korean tungsten industry in a position where it can successfully compete in the world market in time of peace."

Hazards of war have necessitated the assigning of a battalion of United States Army troops to guard against guerrillas and to prevent theft of concentrate. The principal problems to be overcome include the language barrier, antiquity of much of the mining equipment, and maximum utilization of Korean manpower.

There is no question about the amount of ore that exists. It is there—in both the Sangdong scheelite-bismuthenite mine northeast of Seoul and just south of the 38th Parallel, and in the Dalsung wolframite-chalcopyrite mine six miles south of Taegu 100 miles north of Pusan. Reserves of ore at Sangdong are in the order of 1,500,000 tons assaying 1.0 percent plus WO_3. Seven flat dipping replacement beds in limestone have been developed. Main bed is 2,000 feet long, 1,500 feet down the dip, and 14 feet thick. Ore at Dalsung is found in a brecciated pipe 650 feet long and 200 feet wide with a known depth of 650 feet.

Production has been a problem with no spare parts for the 90 percent Japanese-built equipment, with only 40 to 50 pounds air pressure for the rock drills resulting in an average of 28 feet of hole per shift, and use of hand loading and tramming. At Sangdong 360 men are used for tramming 1,000 tons of ore 3,800 feet per day.

Mills are operated at both mines, but recoveries have been low. Flotation and gravity concentration is used at Sangdong and jigs at Dalsung. Jig concentrate is upgraded by hand panning. Utah has installed some modern equipment and more has been ordered and shipped to speed up production.

Policies and Program

At the concluding session of the convention, the following policies were unanimously adopted by the association members and guests. *Labor-Management*—A labor management policy based upon intelligent collective bargaining; promotion of the rights of labor to a fair wage and proper working conditions and protection of the right of management to conduct profitable, efficient, and economically sound operation. *Market Policy*—A policy protecting our domestic industry from the competition of countries whose lower rates of wages and devalued currencies make it possible for them to depress domestic metal markets. *Public Land Policy*—A policy which will foster mineral production by private enterprise on the public domain and in the national forests. *Taxes*—A tax structure such that investors will risk funds in mining so there is some chance of capital recovery, as well as a return on the investment commensurate with the risk. *Roads*—The construction and maintenance of mine-to-market and access roads. *Monetary Policy*—A currency backed by gold and silver. Free circulation, and the right to own and export gold. *Antimony*—Preferential buying of domestically produced antimony for military and other government use on a long-term basis.

SEATTLE WILL WELCOME WESTERN MINING MEN ON SEPTEMBER 21st

Final plans and arrangements have been completed to welcome all western metal and nonmetallic mineral producers to Seattle, Washington for the Western Division meeting of the American Mining Congress which starts on Monday, September 21st at the Olympic Hotel. The preliminary program for the first three days is listed below. On Thursday, September 24th an all-day ferry trip is planned to Victoria on beautiful Vancouver Island. Luncheon will be at the Empress Hotel, famed as a "bit of old England." Special entertainment has been arranged for the ladies.

PRELIMINARY PROGRAM AND SPEAKERS

Monday, September 21

National Policies Affecting Minerals

Chairman:
Howard I. Young
Pres., American Zinc, Lead & Smelting Co., St. Louis;
President, American Mining Congress

Mobilization Progress—Current Program and Future Plans ARTHUR S. FLEMMING, Director, Office of Defense Mobilization

Welcoming Luncheon

Presiding:
Robert M. Hardy, Pres., Sunshine Mining Co., Yakima, Wash.; Chairman, Western Division, American Mining Congress, and General Chairman, Arrangements Committees

Welcome to Seattle and the Pacific Northwest
Hon. Allen Pomeroy, Mayor of Seattle

Responses: Howard I. Young, Pres., American Zinc, Lead & Smelting Co., St. Louis; President, American Mining Congress

Philip R. Bradley, Jr., Pres., Pacific Mining Co., San Francisco; National Chairman, Program Committee

John P. Courtright, Pres., Marion Power Shovel Co., Marion, Ohio; Chairman, Manufacturers Division, American Mining Congress

Public Lands Panel

Moderator: Hon. Henry C. Dworshak, U. S. Senator from Idaho

Panel Participants:
Hon. George W. Malone, U. S. Senator from Nevada
Hon. Wesley A. D'Ewart, Member of Congress from Montana
Hon. Clair Engle, Member of Congress from California
Lewis E. Hoffman, Chief, Division of Minerals, Bureau of Land Management
Raymond B. Holbrook, Attorney, U. S. Smelting Refining & Mining Co., Salt Lake City
Roger S. McConnell, Chief Geol., Bunker Hill & Sullivan Mining & Concentrating Co., Kellogg, Idaho

Advances in Mechanization

Chairman:
S. S. Clarke,
Gen. Supt. of Mines,
Eagle Picher Co.,
Tri State Mines,
Cardin, Okla.

Trackless Mining at Pend Oreille Mine
L. M. Kinney, Gen. Supt., Pend Orcille Mines & Metals Co., Metaline Falls, Wash.

Developments in Equipment, Methods and Controls for Increased Production at Climax
John Petty, Mine Supt., Climax Molybdenum Co., Climax, Colo.

Recent Developments in Mining at Carlsbad
A. B. Chafetz, Asst. Supt. Maint. & Engrng., and E. C. Skinner, Ind. Engr., International Minerals & Chemical Corp., Carlsbad, N. M.

Mechanical Testing of Wire Ropes
W. H. McPherson, McPhar Engineering Co. of Canada, Ltd., Toronto

Tuesday, September 22

Tariff—Taxation

Moderator,
Tariff Panel:
J. B. Haffner,
Gen. Mgr.,
Bunker Hill & Sullivan Mining & Concentrating Co., Kellogg, Idaho

Panel Participants:
Hon. Richard M. Simpson, Member of Congress from Pennsylvania
Andrew Fletcher, Pres., St. Joseph Lead Co., New York
Joseph H. Taylor, Vice-Pres., Peru Mining Co., Silver City, New Mex.
W. Lunsford Long, Vice-Pres., Tungsten Mining Corp., Warrenton, N. C.
Jean Vuillequez, Vice-Pres. & Dir. of Sales, American Metal Co., Ltd., New York
Dr. Gilbert C. Monture, O.B.E., Chief, Mineral Resources Div., Mines Branch, Dept. of Mines & Technical Surveys, Ottawa, Canada
Joseph A. Costello, Vice-Pres., Ethyl Corp., New York

Report of Resolutions Committee: Stockpiling and Tariff Policies

Moderator,
Taxation Panel:
Hon. Thomas E. Martin, Member of Congress from Iowa.

Panel Participants:
Hon. Frank Carlson, U. S. Senator from Kansas
Hon. John W. Byrnes, Member of Congress from Wisconsin
Henry B. Fernald, Loomis, Suffern & Fernald, New York; Chairman, American Mining Congress Tax Committee
L. J. Randall, Pres., Hecla Mining Co., Wallace, Idaho
Ellsworth C. Alvord, Alvord & Alvord, Washington, D. C.; Tax Counsel, American Mining Congress

Rock Breaking

Chairman:
John J. Curzon,
Mgr.,
Chelan Div.,
Howe Sound Co.,
Holden, Wash.

Recent Drilling Trends in Michigan Copper Country
Colin Campbell, Supt. of Mines, Calumet & Hecla, Inc., Calumet, Mich.

Push Feed Drilling at Butte

R. L. Sandvig, Res. Engr., Anaconda Copper Mining Co., Butte, Mont.

Strategic Minerals Luncheon

Chairman: S. H. Williston, Vice-Pres., Cordero Mining Co., Palo Alto, Calif.

Labor Relations—Manpower

Chairman: E. McL. Tittman, Gen. Mgr., Western Dept., American Smelting & Refining Co., Salt Lake City

Mine Incentive Plans for Greater Productivity

A Panel Discussion, led by Ross. D. Leisk, Gen. Mgr., Sunshine Mining Co., Kellogg, Idaho

The Shortage of Young Mining Engineers—What To Do About It?

A Panel Discussion, led by Byron E. Grant, Asst. to Vice-Pres. & Gen. Mgr., Western Operations, U. S. Smelting Refining & Mining Co., Salt Lake City

New Mining Developments

Chairman: Roy A. Hardy, Consultant, Getchell Mines, Inc., Red House, Nev.

Recent Developments at Copper Mountain Mine

L. T. Postle, Vice-Pres. & Gen. Mgr., Granby Consolidated Mining, Smelting & Power Co., Ltd., Copper Mountain, British Columbia

Advances in Iron Ore Mining

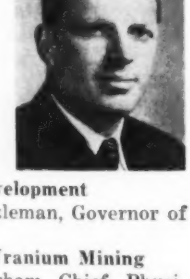
Richard W. Whitney, Gen. Mgr. of Minnesota Mines, M. A. Hanna Co., Hibbing, Minn.

Steel Rail Sets at Resurrection Mining Co.

William R. Doyle, Newmont Exploration Co., Montrose, Colo.

Wednesday, September 23

New Horizons for Minerals



Chairman: Philip R. Bradley, Jr., Pres., Pacific Mining Co., San Francisco

Alaska and Its Development

Hon. Frank Heintzleman, Governor of Alaska

Opportunities in Uranium Mining

Thomas E. Gillingham, Chief, Physical Exploration Branch, Div. of Raw Materials, U. S. Atomic Energy Commission, New York

Research—Foundation for Mineral Progress

Clyde Williams, Dir., Battelle Memorial Institute, Columbus, Ohio

Open Pit Mining

Chairman: Walter A. Sterling, Pres., Cleveland-Cliffs Iron Co., Cleveland

Comparison of Churn, Rotary, and Impact Drills for Drilling Large Blastholes

John A. Lentz, Jr., Mine Supt., New Cornelia Branch, Phelps Dodge Corp., Ajo, Ariz.

Changes in Primary Drilling at Northwest Magnesite

Roger L. Fisk, Supt. of Mines, Northwest Magnesite Co., Chewelah, Wash.

Trends Toward Larger Shovels in Mining and Earthmoving—A Panel Discussion

Chairman: L. F. Pett, Gen. Mgr. Utah Copper Div., Kennecott Copper Corp., Salt Lake City

R. M. Dickey, Sales Mgr., Large Machine & Dredge Sales, Bucyrus-Erie Co., South Milwaukee

A. F. Busick, Jr., Vice-Pres.-Engrng., Marion Power Shovel Co., Marion, Ohio

Norman E. Maclean, Southwestern Sales Mgr., American Manganese Steel Div., Los Angeles

R. E. Meyer, Chief Engr., Large Excavator Div., Harnischfeger Corp., Milwaukee

Gold and Silver

Chairman: Donald H. McLaughlin, Pres., Homestake Mining Co., San Francisco; Chairman, American Mining Congress Gold Producers Committee

Speakers:

Hon. Pat McCarran, U. S. Senator from Nevada

Merrill E. Shoup, Pres., Golden Cycle Corp., Colorado Springs, Colo.

Robert P. Day, Pres., Cordillera Corp., Seattle

O. H. Solibakke, Dir., Cariboo Gold Quartz Mining Co., Ltd., Wells, British Columbia

Nonmetallic Minerals

Co-Chairmen:

Drury A. Pifer, Dir., School of Mineral Engineering, Univ. of Washington, Seattle

Sheldon L. Glover, Supervisor, Washington State Div. of Mines & Geology, Olympia, Wash.

Research in Ceramic Industry

W. O. Brandt, Res. Dir., Gladding McBean & Co., Los Angeles

Economic Problems in Nonmetallic Industries

Ray Stafford, Technician, Southern California Mineral Co., Los Angeles

Nonmetallic Industry of the Pacific Northwest

H. J. Kelly, Ceramist, U. S. Bureau of Mines, Northwest Experimental Station, Seattle

Developments in Prospecting

Chairman: Philip Shenon, Dir., Day Mines, Inc., Wallace, Idaho

Use of Geology in Ore Delineation and Extraction

Robert E. Sorenson, Geol., Hecla Mining Co., Wallace, Idaho

Geophysical Prospecting

Dr. A. A. Brant, Newmount Exploration Ltd., New York

Radiometric Prospecting

R. N. Moxham, Geophysicist, U. S. Geological Survey, Washington, D. C.

Aerial Color Photography in Ore Search

Philip Laylander, Aerogeological Exploration, Fallon, Nev.

Milling and Metallurgy

Chairman: Max W. Bowen, Vice-Pres., Golden Cycle Corp., Colorado Springs, Colo.

New Developments in Milling and Leaching

D. W. McGlashan, Res. Prof. of Mineral Dressing, Montana School of Mines, Butte, Mont.

Some Aspects of Alkaline Pressure Leaching Processes

Dr. Frank A. Forward, Met. Engr., Univ. of British Columbia, Vancouver, B. C.

FluoSolids Roasting at New Carlton Mill

T. B. Counselman, Mgr., FluoSolids Div., The Dorr Co., Stamford, Conn.

Uranium

Chairman: T. O. Evans, Chief Mng. Engr., Atchison, Topeka & Santa Fe Railway Co., Prewitt, N. Mex.

Background of Domestic Uranium Production

Blair Burwell, Pres., Minerals Engineering Co., Grand Junction, Colo.

Mechanics of Uranium Production

Sheldon P. Wimpfen, Mgr., Grand Junction Operations, U. S. Atomic Energy Commission, Grand Junction, Colo.

Uranium Mining in New Mexico

John B. Knaebel, Mgr., Anaconda Copper Mining Co., Grants, N. M.

Methods of Processing Uranium Ores

J. S. Swainson, Dir., Ore Dressing Laboratory, American Cyanamid Co., Stamford, Conn.

Tax Problems Related to Uranium Mining

Geology, Big Indian Mining District

Charles A. Steen, Chief Geol., Utex Exploration Co., Moab, Utah.

Muriel Sibell Wolle Describes

CORNUCOPIA: OREGON GOLD CAMP

Cornucopia, a gold camp in the mountains of eastern Oregon, is most easily reached from Baker, Oregon. Baker itself is not a mining town, but it grew out of the eastern Oregon gold rush in 1863, and became a supply center for the mining camps in the Blue and the Wallowa Mountains.

In 1951 I visited Cornucopia, leaving Baker and driving east along the Powder River almost to Robinette. From there the road climbs north into fertile Pine Valley, whose northern boundary consists of the granite-faced Wallowa Mountains. Two towns, Halfway and Carson, lie in this valley. Halfway is an agricultural center; Carson, an older town and once the scene of placer activity, is now a quiet farming community. Five miles beyond Carson and 1,200 feet higher in elevation, at the head of Pine Creek, is Cornucopia.

Pine Creek, which runs far below the road to the mining camp and whose banks are densely covered with second-growth timber, was the scene of rich placer operations in the 1870's and 1880's. As early as Oct. 2, 1875, Idaho's *Owyhee Weekly Avalanche* advertised that: "J. W. Moore has just put on a stage to Cornucopia and will carry passengers and freight between Silver City and that place and return. Fare $10.00. Mr. Moore guarantees grub for the trip by the payment of $15.00. The next trip to leave the 9th of October."

The Cornucopia placers extended from just below the town for several miles downstream toward Carson. Big piles of boulders and fragments of pipes and old machinery are still visible in the creek bed. Two miles below the town, near the mouth of Boulder Creek, were the Underwood-placers where there was a "bench boulder gravel deposit with bedrock several feet above the present stream." The best pay gravel was found in an old channel of Pine Creek. This whole location was later developed by the Boulder Creek Mining Co. who equipped the property with "flumes, pipes, giants and derricks operated by water-power" and proceeded to hydraulic the ground. The gold recovered was close to bedrock and was coarse in texture.

With the subsequent discovery of lode mines, the Cornucopia mining district was formed. It was small in area—all mines and prospects being within four miles of the town, but according to the Oregon Bureau of Mines' report of December 1916 written by H. M. Parks and A. M. Swartley there were "many prospects on both slopes of Granite Mountain as well as on Red Mountain and Simmons Mountain; in Norway Basin and those to the east and south of the town. . . . Veins on Granite Mountain are two or three miles to the north and east of the town and at an elevation of 1,000 to 3,000 feet above it."

The Union and Companion claims, covering gold-bearing veins which form the nucleus of the Cornucopia group of mines, were located in 1878 or 1880. A short time afterward, 25 other mines, also part of the same group, were staked. The Union and Companion claims were developed by the owners until 1895 and some bullion was produced. That year the property was sold to the Cornucopia Mines Co. of Oregon for $60,000. The new owners promptly erected a 20-stamp mill and a chlorination plant. These ran successfully until 1903, by which date the mines had produced gold valued at more than a million dollars. This amount was then put back into the property for further development. The mines closed down during the year 1903 but were reopened at a later date. The shaft of the Cornucopia mine was high above the town at an elevation of 6,300 feet and when the property was at its peak production, it contained 30 miles of underground workings.

The Last Chance mine, owned by the Baker Mines Co., was still higher up the mountain with its principal workings at 7,000 feet elevation. Other properties in the district included the Queen of the West, on the opposite side of Bonanza Basin from the Last Chance; the Mayflower; the Jim Fisk nearby; the White Elephant; and the Wild Irishman, later known as the Valley View. The Simmons Group was boosted by its backers as being a "property that capital has been seeking to get hold of for years and

(*Continued on page* 114)

Main street of Cornucopia in 1951, looking toward the Wallowa Range.

ACTIVITIES OF U. S. MINING MEN

DR. ERNEST NEWTON PATTY assumes the presidency of the University of Alaska this month. Dr. Patty organized the University of Alaska School of Mines to meet the special demands of Alaskan mining operations when he was on the faculty some years ago. He left to return to his mining interests. Dr. Patty is a principal in two gold mining companies: the Alluvial Golds, Incorporated in the Yukon, and Gold Placers, Incorporated, which operates dredges in the Fairbanks region.

Bruce Swartout of McNary, Arizona, has resigned his position as general manager of the Apache Railway in order to devote his time to manganese, iron ore, and asbestos mining possibilities in Apache and Navajo counties in Arizona.

Paul F. Kerr, mining professor at Columbia University in New York, is doing a geological study for the U.S. Atomic Energy Commission on Western Gold & Uranium, Incorporated's property at Marysvale, Utah.

Kurt Weinberg has been elected senior vice president of International Minerals & Metals Corporation. Other officers include **H. Fred Baerwald**, vice president and assistant to the president; **Theodore Gruen**, vice president; **Frederick R. Jeffrey**, vice president; and **James W. Greene**, comptroller.

Minerals and Metals Subcommittee of the United States Chamber of Commerce Committee on Natural Resources includes **Ralph L. Dickey**, president of Kelley Island Lime and Transport Company of Cleveland, Ohio; **R. C. Klugescheid**, vice president and general counsel of Kennecott Copper Corporation, New York; **Lawrence Litchfield, Jr.**, general manager of the Mining Division of the Aluminum Company of America, Pittsburgh, Pennsylvania; **Frank E. McCaslin**, president of the Oregon Portland Cement Company, Oregon; **H. L. Pierce**, president of the Hanna Nickel Smelting Company of Cleveland, Ohio; and **Richard A. Young**, vice president of American Zinc, Lead & Smelting Company of St. Louis, Missouri.

JOSEPH A. MECIA has returned to Korea for the Utah Construction Company which is working with the Korean government under a management - type contract for modernization of pre-war operations. Mr. Mecia, who coordinates activities for the project, was in the United States to purchase additional equipment and to confer with Utah Construction Company officials.

J. B. Pullen is serving as an assistant general manager of the Phelps Dodge Corporation in the Douglas, Arizona office. Formerly he was manager of the New Cornelia Branch at Ajo, Arizona. Mr. Pullen, who has been with Phelps Dodge since 1923, will take over certain duties in the offices of general manager **Charles R. Kuzell** and assistant general manager **W. C. Lawson. A. T. Barr**, formerly general superintendent of the New Cornelia Branch, will succeed Mr. Pullen as manager of the operation.

Robert A. Lovett, former United States Secretary of Defense, has been elected to the board of directors of the Freeport Sulphur Company.

Marshall Haney, consulting mining engineer, recently examined a North Carolina tin deposit. He is from Takoma Park, Maryland.

DR. W. B. MATHER, chairman of the minerals technology department at Southwest Research Institute, has returned from a trip to Brazil. He spent ten weeks on an Institute project studying Brazilian pegmatites. Before this recent trip, Dr. Mather was mineral advisor for the Joint United States-Brazil Commission for Economic Development, a position which he held for a year.

Tom Lyon has resigned his position as Acting Deputy Administrator of the U. S. Defense Materials Procurement Agency.

F. J. Lauten is now serving as senior process engineer in the research department at the American Potash & Chemical Corporation at Trona in Southern California. Formerly he was with the Solvay Division of Allied Chemical and Dye Corporation of Syracuse, New York.

Alfred R. Flinn is resident mining engineer in the New York office of The New Jersey Zinc Company. His last position was that of assistant superintendent of New Jersey Zinc's Sterling mine in Ogdensburg, New Jersey.

Richard L. Stewart has been appointed assistant director of public relations for the Utah Copper Division of Kennecott Copper Corporation. He succeeds **C. R. Naylor** who has been appointed superintendent of the Garfield Improvement and Garfield Water Companies at Garfield, Utah, both of which are operating affiliates of Kennecott.

Edwin D. McKee has resigned as head of the geology department of the University of Arizona at Tucson to become a staff geologist for the paleotectonic map project of the U. S. Geological Survey in Denver, Colorado.

GROVER J. HOLT, former manager of Minnesota mines for the Cleveland-Cliffs Iron Company, has been appointed general manager of the mining department, with headquarters at Ishpeming, Michigan. **CHARLES W. ALLEN**, who was formerly general manager of the mining department, has been made vice president in charge of mining, land, and lumbering operations. **HUGH J. LEACH**, former superintendent of the Hill-Trumbull mine at Marble, Minnesota, will manage the Minnesota mines for Cleveland-Cliffs. His headquarters will be at Hibbing.

John F. Lance, assistant professor of paleontology since 1950, has been made associate professor and named acting head of the department of geology.

Charles Bentley has retired from full-time work as an analyst for the engineering and mining experiment station at the School of Mines and Technology in Rapid City, South Dakota.

George P. Rowe succeeds V. A. Giles as chief mining geologist for the Northern Pacific Railroad. Mr. Giles will be consulting geologist for the railroad.

George Herbst, mining engineer has been promoted to mines foreman in the Cooley district of Minnesota, for the M. A. Hanna Company. Other company promotions include Leonard Beebe who has been made plant foreman at the Section 18 mine, and **Charles Mattson** who has been made plant foreman at the Carlz mine, both operations on the Mesabi Range.

C. O. Rudstrom has been appointed general superintendent of all Snyder Mining Company's properties in Minnesota. His most recent position was that of superintendent of the company's Shenango mine at Chisholm, Minnesota and assistant superintendent of the White Side mine at Buhl, Minnesota.

Kenneth Duncan has retired as manager of ore mines for Pickands Mather & Co. He will continue as a consultant for the firm. **Everett L. Joppa** is the new manager of ore mines and **Otto L. Yauch** is the new manager of engineering.

Ronald J. Morton has been named manager of research for the Oliver Iron Mining Division of the United States Steel Corporation. Mr. Morton, former concentration engineer, will be responsible for the company's research and development work on taconite and low-grade ore concentration.

John Englund is on the staff of Pickands Mather & Co. as a junior

(*Continued on page* 115)

ACTIVITIES OF INTERNATIONAL MINING MEN

R. H. BEHRENS has retired as managing director of A/S Sydvaranger at Kirkenes, Norway and has been elected vice chairman of the board of directors. Johan Kraft-Johanssen has been named managing director to succeed Mr. Behrens. Mr. Behrens has been with the company for 45 years. Mr. Kraft-Johanssen, former technical director, supervised the reconstruction of operations at Kirkenes which were badly damaged during World War II.

Victor P. Geffine has resigned from his position as senior vice president of the Cleveland-Cliffs Iron Company of Cleveland, Ohio and has been named president of the Newfoundland and Labrador Corporation, Ltd., a government-backed mineral and timber development company set up by the Newfoundland government. Mr. Geffine succeeds **Chasley A. Pippy.** He will also become president of the Cliffs Power and Light Company, a power program for development of jasper beneficiation operations on the Marquette Range and for provision of ore expansion programs of Cleveland-Cliffs and other companies on that range.

Claude E. Fertig, former assistant superintendent of Itogon Mining Company which has its properties at Sangilo, Itogon, Mountain Province, Philippines, has been promoted to the position of general superintendent. Mr. Fertig has been vacationing in the United States. During his absence, **Roscoe Canon,** superintendent of the Southern Division of Marsman and Company, Inc., of Manila, Philippines, assumed his duties.

George R. Schaefer, general superintendent of Minas de Matambre, largest Cuban copper producer, has been making an extended tour of Western United States mining districts.

Toni Hagen, Swiss geologist, is on an assignment for the United Nations Technical Assistance Administration in the Kingdom of Nepal where he is making the first detailed geological survey of this territory. Mr. Hagen uses Kathmandu as his home base between field trips. He states that "nine mines have been examined and four special reports concerning road construction, hydro-electric dam projects and water supply for the capital have been handed over to the Government." Mr. Hagen believes that, "The production of geological maps, well backed by proper scientific interpretation, will be a first step towards the development of mineral and other resources."

Vincent J. White of Athens, Greece, is with the Northern Greece Gold Field Company.

M. R. Cort, mine superintendent of the Philippine Iron Mines, recently retired. He has been associated with the company for a number of years.

Dr. Elwood S. Moore of Toronto, Canada is now an associate of Behre Dolbear & Company, mineral consulting firm with offices in New York.

Vernon K. Stubblefield is new assayer for United States Smelting Refining and Mining Company's dredging operations in Fairbanks, Alaska. Mr. Stubblefield, former head assayer for Bradley Mining Company at Stibnite, Idaho, reports that the company is currently operating six dredges in the vicinity.

W. L. W. Taylor has left Cerro de Pasco Corporation in Peru and is now employed as a field geologist for Falconbridge Nickel Mines, Ltd. in Badger, Newfoundland, where the company has a large copper exploration program underway.

Professor Olof H. Odman has received an official invitation from Nacional de Pesquisas in Brazil to lecture on Swedish ore geology in Rio de Janeiro and Sao Paulo. Professor Odman is affiliated with the Royal Institute of Technology, School of Mines, in Stockholm, Sweden.

W. H. Loerpabel, general manager for the South American mining department of American Smelting & Refining Company, has left his New York headquarters to take a trip to South America.

Robert N. Parkinson is one of a group of four experts on Canadian Precambrian geology who will study similar formations in Portuguese East Africa. Companhia Mineira do

Leading personalities at the opening of the Blyvooruitzicht uranium plant in the western Transvaal, Union of South Africa, include from left to right: Front row—W. M. Frames, W. H. A. Lawrence, A. E. Jones (South African representative for the Combined Development Agency), C. C. P. Wagener. Second row—L. G. C. Wright, T. K. Prentice (consulting metallurgist for Rand Mines, Ltd., and chairman of the Uranium Technical Sub-Committee of the Chamber of Mines), J. M. Rothman (Under-secretary for Mines and member of the Atomic Energy Board), D. G. Malherbe, R. R. Porter (consulting metallurgist of the Chamber of Mines and member of the Uranium Technical Sub-Committee). Back row—J. W. Shilling, W. M. Kinghorn, N. B. Locke, J. H. Bath (Blyvoor uranium plant superintendent), J. K. E. Douglas, D. D. Stitt, and C. G. Peachey.

PATRIC H. O'NEILL is now chief engineer for Compania Minera Choco Pacifico, a subsidiary of South American Gold & Platinum company in Andagoya, Colombia. Previously, he had been dredge superintendent in the Fairbanks, Alaska department of the United States Smelting Refining & Mining Company and also had worked in the stripping, surveying, prospect drilling, and exploration departments of the same firm. Mr. O'Neill was graduated from the University of Alaska School of Mines in 1941.

Lobito is investigating a large concession and has brought in U. S. engineers to carry on mining operations in the event that deposits are discovered.

Vincent G. Rumpf has been assigned to work on a fleet of gold and platinum dredges in Cali, Colombia, for Colamer Company of New York. He formerly was engineer for Telluride Mines, Inc. in Colorado.

B. Magnusson has left Husquarna Vapenfabriks AB, where he was director of research, to accept a new position at Aktiebolaget C T C in Gothenburg, Sweden.

Edvard Mueller has moved from Vicille Montagne at Linkgruvan, Sweden to Forfattarvagen 15, Bromma, Sweden. **C. A. Widen** succeeds him as mining engineer at Vicille Montagne.

Six Thai and two Turkish engineers are being trained by the U. S. Geological Survey in the occurrence, movement, and chemical quality of water in the United States. **Sebahattin Sayin,** head of the design and construction of water supply, irrigation, and drainage works in Ankara, and **Osman Bedi Usta,** vice president and director of the water supply section of the Hydraulic Department, Ministry of Public Works, are the Turkish representatives. The trainees from Thailand, all engineers employed in the Royal Irrigation Department, are **Duang Bunnag, Thongchai Chotibut, Phrasarn Leelasara, Paisarn Sukumparnich, Adul Thavisri,** and **Vichin Tiraparnish.**

Stig Rahm and **Tore Sjoqvist,** safety engineers for Boliden Company in Kristineberg, Sweden, recently visited iron ore mines in Minnesota, Wisconsin, and Michigan to gather information on mine safety and ventilation. Boliden operates copper, lead-zinc, silver, and gold mines in the Arctic region.

P. W. J. Van Rensburg has left his job as underground manager for Robinson Deep, Ltd. in Johannesburg, South Africa to take a similar position with Venterspost Gold Mining Company, Ltd. in Westonia, Transvaal, South Africa.

Thor

offers a Complete Selection of

ROCK DRILLS

To Increase Your Tonnage On Every Blasting Job

STOPERS

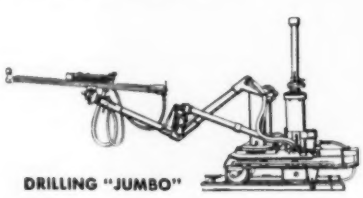
SINKER ROCK DRILLS

SUMP PUMPS

Thor Rock Drills, famous everywhere for power and durability, give an extra bonus of rock penetration when used with the new Thor air feeds—legs, bars, shell motors and the great, new track-mounted "Jumbo". For greater footage, lower air and maintenance costs, and all-around satisfaction, use Thor mining equipment. Ask your Thor distributor for a demonstration, or write for free catalog.

DRIFTERS

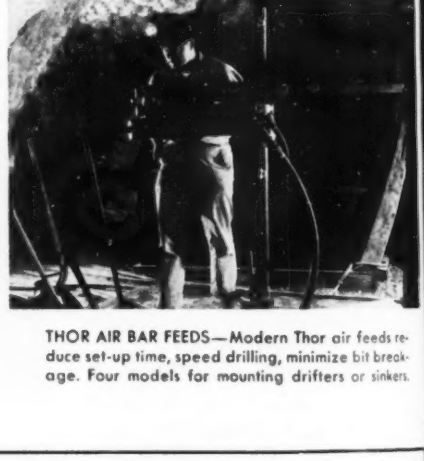
SINKER LEGS



DRILLING "JUMBO"

THOR DRILLING "JUMBO"—A completely modern, track-mounted carriage for speeding drifting and tunnelling operations. Air-operated roof-jack, boom, feed motor and drifter. Mounts one or two drills.

THOR STOPERS—Extremely compact and powerful. Button-type Air Feed Release for easy control and complete safety. Six models, including reverse feeds.



THOR AIR BAR FEEDS—Modern Thor air feeds reduce set-up time, speed drilling, minimize bit breakage. Four models for mounting drifters or sinkers.

THOR POWER TOOL COMPANY

AURORA, ILLINOIS • Branches in Principal Cities

Export Division: Thor Power Tool Company, 330 W. 42nd St., New York, N.Y., U.S.A. • *Cable Address:* THORTOOLS

GREAT BRITAIN
INDEPENDENT PNEUMATIC TOOL CO. LTD.
40 Broadway, S.W. 1, London

BRITISH FACTORY
Armstrong Whitworth & Co. (Pneumatic Tools) Ltd.
Tynemouth
England

WESTERN EUROPE
Thor Tool Continental, Inc.
Jordaenskaai No. 25
Anvers, Belgique

SOUTH AFRICA
R. H. Dungey, Resident Engineer
P. O. Box 483, Benoni, Transvaal

CENTRAL AMERICA
Herramientas Thor de México S. A. de C. V.
Basilio Badillo No. 47
México D. F., México

BRASIL
Thor Tool Hemisphere, Inc.
Visconde de Parnahiba 1199, São Paulo

CANADA: Thor Power Tool Company, 1909 Davenport Road, Toronto, Ontario

Hamme Mine Expansion

(Continued from page 50)

After a narrow-vein stope is developed (see diagram), it is mined the floor at a time through the entire stope length.

When the vein is wider than 9 feet (as most of them are), miners drive the initial development drift 7 feet wide on the footwall; then they advance the hanging wall portion by driving breast rounds parallel to the drift. This parallel drilling breaks ore toward the track, where it can be loaded by mucking machine. Starting at the footwall side and working toward the hanging wall, they back stope an 8-foot round, muck out, and develop sill chutes.

Chutes are carried up along the footwall. In wide veins, cross-slushing brings ore to the chute. Where horses and stringers of waste occur, miners sort the ore and gob the waste. Waste rock from development work is passed to lower levels for stope fill whenever possible; also, considerable hoisted waste rock and mill tailing are passed from the surface through openings to lower stopes for fill.

Formerly, Tungsten Mining Corporation used framed, post-butting, square-set oak timber. This was changed to an unframed, cap-butting set. The sets are 5 by 5 feet with 8-foot posts. Caps and posts are from 8 by 8-inch stock and girts from 4 by 6-inch stock. Lagging comes cut to 5-, 7-, and 9-foot lengths.

"Unframed timber," says mine superintendent O'Donnell, "gives us a great deal more flexibility in the mine."

This is a partial list of the kind of equipment used underground at Hamme mine:

Drifting: Ingersoll-Rand DA-30 drifters.

Stoping: Ingersoll-Rand R-58 stopehamers.

Drill Steel: One-inch hexagonal threaded steel.

Powder: Gelex, 45 percent strength.

Loading: Eimco 12-B loaders.

Mine Cars: C. S. Card, 28-cubic-foot side dumpers.

Trammers, Production: Mancha electric mules.

Persistence in Depth

Exploration crews work full time at Hamme mine. On the surface, one daytime crew keeps a Sprague & Henwood H138 diamond drill busy the year 'round. Underground, crews work a Sullivan HS-15 on both day and night shifts.

Tungsten Mining Corporation's main veins run along a shear zone that extends for several miles through the low hills of the Hamme district. The mine itself has a substantial tonnage of proven ore developed. The development on the lower levels indicates the persistence of ore in depth. The future looks good.

Mill Capacity Doubled

How the Tungsten Mining Corporation doubled the capacity of its gravity concentration mill will be described in the November issue of MINING WORLD. Closely sized products are tabled, gravity cencentrates are dried by infra-red bulbs, and four concentrates are made by magnetic separator cleaning in the enlarged mill.

FREE STATE GEDULD SUCCESSFULLY PLUGS NO. 2 SHAFT BOTTOM TO SEAL OFF WATER

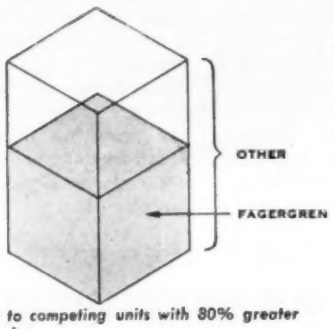
The Free State Geduld Mines Ltd. has successfully dewatered its twice flooded 5,350-foot-deep Free State Geduld No. 2 shaft in the Orange Free State, Union of South Africa. See MINING WORLD, March 1953, pp. 47 and 85 for complete details of the shaft flooding, first dewatering, and second flooding. The earlier article reported that plans had been made by the company, the engineers of the Anglo American Corporation of South Africa Limited, and the cementation contractor—The Cementation Co. (Africa) (Proprietary) Ltd. for pouring of a concrete plug in the shaft bottom to seal out water before dewatering again was to be undertaken.

In accordance with these plans, four pipe columns were installed in four shaft compartments ahead of the rising water. The first column was bottomed just at the brow of the 5,350-foot station, and the next three were each bottomed 20 feet successively higher in the shaft. The shaft was again filled with water until a reverse flow was achieved with water from the shaft flowing into the water-bearing fissures. Then to form the base for concrete plug, 500 tons of sand were dropped to the shaft bottom through a 10-inch pump column which had been used during shaft sinking and left open-ended 150 feet above the 5,350 station. Cement grout was pumped through the longest of the four columns until it was believed a partial sealing of the water fissure had been made.

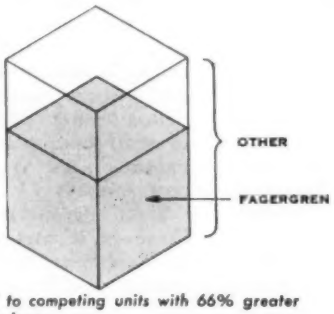
The next stage was to place rock (aggregate) in the shaft bottom. Rock, from ¾ to 1½ inch in size, was dropped to the shaft bottom through the 10-inch pump column until it plugged. Thereafter, bricks and larger rocks were dropped directly into two of the shaft compartments. After the shaft bottom was filled with an estimated 100 feet of aggregate—sand, bricks, and rocks—grouting was continued to form concrete. Grout was pumped through the four special columns starting with the longest and pumping progressively through the remaining three. A total of 54,000 bags of cement were pumped into the shaft before testing (by lowering a bucket to shaft bottom every two hours) indicated the concrete plug had been formed.

Shaft dewatering then started. However, it was realized that four shaft columns that had been used in sinking bottomed below the new concrete plug, and that water might flow into the shaft through these pipes. There was, of course, the chance that concrete had filled the pipes or that the great water pressure might have collapsed them. After dewatering to 3,000 feet, it was found that one of the pipes, a 6-inch air column, was releasing about 50 gallons of water a minute into the shaft. Pumping was continued and it was discovered that another 6-inch air column and two 4-inch pump columns had not been plugged and were releasing a total of 190 gallons per minute. Dewatering continued to a depth of 5,105 feet where the first aggregate was found. It was then decided that the water flowing through the four pipes should be brought under control to prevent possible damage from the high pressure of the water. The pipes were cut and a 150-foot length of "telescopic pipe" forced into each column and cemented in place. High pressure water from below the plug could then escape only through the telescopic pipe which was, in turn, connected to a high pressure column equipped with valves leading to the 4,750 pump station. The solid top of the concrete plug was found at a depth of 5,215 feet. As an added precaution, a concrete mat, firmly anchored into the solid rock, has been placed on top of the shaft plug.

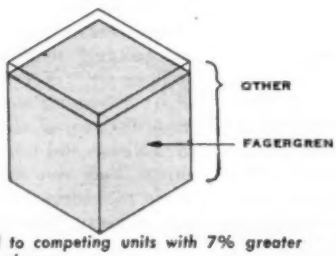
GREATER FLOTATION RECOVERY



1. *Compared to competing units with 80% greater total cell volume*
Fagergren superiority is:
+ 2c per ton **metal recovery** over competing units.
+ 2½c per ton **economic recovery** over competing units.



2. *Compared to competing units with 66% greater total cell volume*
Fagergren superiority is:
+ 2⅔c per ton **metal recovery** over competing units.
+ 3c per ton **economic recovery** over competing units.



3. *Compared to competing units with 7% greater total cell volume*
Fagergren superiority is:
+ 6⅔c per ton **mutal recovery** over competing units.
+ 6c per ton **economic recovery** over competing units.

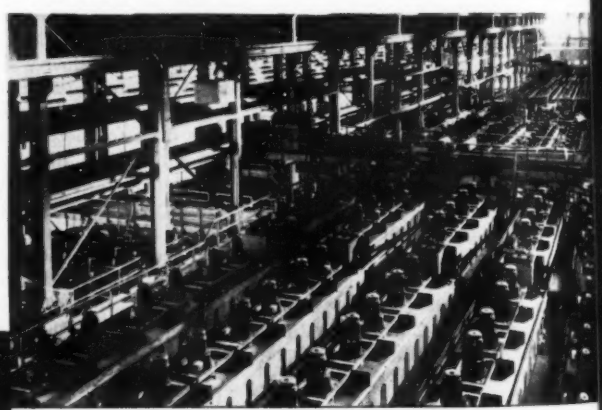
Write today for descriptive bulletin and information on how Fagergren machines can help solve your flotation problems.

WITH LESS **TOTAL** CELL VOLUME!

These test results prove Fagergren superiority

- The figures shown here are the results from extensive tests recently conducted by a large mining company. They graphically illustrate that Fagergren Flotation Machines out-perform other machines having as much as 80% more total cell volume. Note also that when the total cell volume of Fagergren units and other machines is more nearly equal, the advantages of Fagergren operation are even more pronounced. These results and other related tests prove conclusively that in terms of lower tailing losses, higher concentrate grade, lower reagent costs and lower smelting charges, Fagergren machines are superior on every count.

- **Fagergren's high metallurgical efficiency** results from the faster rate of flotation achieved by Fagergren's exclusive rotor-stator design. This powerful agitating mechanism produces larger numbers of smaller, livelier bubbles thus increasing the total mineral attachment area. The unmatched efficiency of this pulp aeration and dispersion assures greater capacity per cubic foot with higher mineral recovery. Because Fagergren cells do a better job with fewer cubic feet, substantial savings are possible due to lower investment required, reduced floor space and less operating and maintenance costs.



WEMCO
WESTERN MACHINERY COMPANY
760-766 FOLSOM STREET · SAN FRANCISCO 7, CALIFORNIA

Mobil-Mills · Coal Spirals · HMS Thickeners · HMS Pumps · Sand Pumps Cone Separators · Drum Separators · Fagergren Laboratory Units · Agitators Fagergren & Steffensen Flotation Machines · Hydroseparators · S-H Classifiers HMS Laboratory Units · Dewatering Spirals · Thickeners · Conditioners · Densifiers

PRINCIPAL OFFICES
San Francisco • Sacramento
Salt Lake City • Spokane
Denver • Phoenix
Chicago • Hibbing, Minnesota
New York • Birmingham
Toronto, Canada
Jeffersonville, Indiana

EXPORT DISTRIBUTORS
Fraser & Chalmers (S.A.) Ltd.
P. O. Box 619, Johannesburg, South Africa
Lilestone & Co., Inc.
P. O. Box 3368, Manila, Philippines
United Development Corporation Pty. Ltd.
P. O. Box 3460, Sydney, N.S.W., Australia
Corporation Commercial Sudamericana S.A.
Casilla 505, Lima, Peru

INTERNATIONAL NEWS

Export-Import Bank Aids Peru Iron Ore Production

A $2,500,000 loan from the Export-Import Bank of Washington, D.C. for production of Peruvian iron ore has been granted to Marcona Mining Company of San Juan Bay, Peru. Marcona, a subsidiary of the Utah Construction Company and Cyprus Mines Corporation, is developing the Marcona iron ore deposit in the Southern Peru under a concession from the Corporation Peruana del Santa a government agency. The deposit is located 20 miles inland from the Bay of San Juan on the Peruvian coast 370 miles south of Lima, and is said to have reserves of about 100,000,000 tons of high-grade ore, with about 60 percent or more iron content.

The project includes open-pit mining, truck transport to the seaport, and shiploading facilities at the port. Annual production, expected to be about 2,000,000 tons of ore per year, will be purchased by steel mills in the United States. Shipments are already being made to the United States Steel Corporation's Fairless Works at Morrisville, Pennsylvania. According to company spokesmen, the loan will "allow for more flexibility in operations."

Control of Tungsten Mine Acquired by British Firm

A controlling interest in Sociedade das Minas do Gerez Limitada, which operates the Gerez wolframite mine in the northern part of Portugal, has been acquired by the British firm of Mason & Barry Ltd. Plans call for increased production by the end of the year with the addition of necessary plant and power equipment.

Monthly deliveries of concentrate are currently being made to the United States Defense Materials Procurement Agency under terms of a contract negotiated in 1951 where about $102,000 was advanced to provide for expansion of production at the mine. Repayment of the loan (in the form of concentrate deliveries) is expected to be completed by the spring of 1954.

DMPA Reports Amounts of Domestic Materials Bought

Termination date for the U.S. government's purchase programs for domestic tungsten, manganese, chrome, beryl, and columbium-tantalum has been extended. Quantities purchased to date under the program, set up to stimulate the search for and production of strategic and critical materials inside the United States, include the following:

Tungsten concentrates have been accepted at various milling points, mostly in the West, in the amount of 283,495 short ton units. The regulation setting up the tungsten purchase program authorized purchase of 3,000,000 short ton units (20 pounds each).

Manganese delivered to date at four depots amounts to 234,000 long ton units at Butte, Montana; 169,000 at Philipsburg, Montana; 706,500 at Deming, New Mexico; and 904,000 units at Wenden, Arizona. Manganese is also accepted at any rail point in the country in carload lots. The carload program has received 188,000 units. Regulations authorized 6,000,000 long ton units (22.4 pounds) of contained manganese for Butte and Philipsburg together; 6,000,000 tons for Deming; 6,000,000 for Wenden; and 19,000,000 for the carload program.

Chrome ores and concentrates delivered to date at a depot at Grant's Pass, Oregon are 31,604 long tons. The program allows for purchase of 200,000 long tons of ores and concentrates.

Beryl delivered to date at the Franklin, New Hampshire depot is 60,169 pounds; at Custer, South Dakota, 71,326 pounds; and at Spruce Pine, North Carolina, none. Authorized purchases are 1,500 tons and total delivered in terms of the program, is 66 short tons.

Columbium-tantalum ores and concentrates in small lots have been delivered as follows: At Custer, 1,057 pounds; at Franklin, 106 pounds; and at Spruce Pine, none. Purchase of 15,000,000 pounds of contained combined columbium-tantalum pentoxide has been authorized. Deliveries under the large-lot program will be announced at a later date. Columbium-tantalum in lots of 2,000 pounds and over is purchased from both domestic and foreign sources through four agents—Fansteel Metallurgical Corporation, North Chicago, Illinois; Wah Chang Corporation, New York; Kennametal, Inc., Latrobe, Pennsylvania; and Emergency Procurement Services, GSA Washington, D.C. Depot purchases come under the limitation of the over-all columbium-tantalum program administered by the DMPA, but no specific limits have been set for the depots.

Australia Will Develop Rum Jungle Uranium

The Combined Development Agency of Australia has advanced more than £A1,100,000 to the Commonwealth Government for development of the Rum Jungle uranium field in the Northern Territory. An additional advance of at least that much will be made in 1953-54. It is believed that further development costs can be met from uranium sales.

The government has more than doubled the price for uranium ore to encourage prospecting and development of deposits. The new prices are on a sliding scale and range from $4.32 per pound of U_3O_8 for up to 1.0 percent ore to $5.40 for 10.0 percent ore. The old price, dating from 1948, was $2.04 per pound of contained uranium. The new price guarantee applies to a maximum of 20,000 tons of ore from any one producer in one year.

Norway Columbium Mining Begins In Sove Ore Fields

Columbium mining in the Sove ore fields near Ulefoss in south Norway is underway on a trial basis and if investigations of nearby fields are as promising as indicated by preliminary survey, full production will begin soon. The Sove field has been developed by the government-controlled mining company, Norsk Bergverk, A/S at a cost of 2,000,000 kroner.

About 40 percent of the columbium to be refined at a plant now under construction, will be used to pay off a long-term development loan from the United States. The initial production capacity of the refining plant is based on extracting 40,000 tons of raw ore a year from the Cappelen deposits, estimated to contain over 470,000 tons of proved ore.

Surveys have determined the existence of 970,000 tons of ore at nearby Hydrogangen. It is estimated that these two deposits will yield a total of about 3,200 tons of columbium oxide. A third deposit at Tuft, judging from initial prospecting, may contain as much ore as the other two combined.

Exploration Under Way On Colombian Deposits

Asbestos Colombianos, S. A. has four diamond drill rigs at work in its exploration of asbestos deposits located in the Department of Antioquia, Colombia.

The firm was formed last fall by Johns-Manville Corporation, Eternit Colombiana, S.A., Sociedad Colombiana de Asbestos, Ltda., and the Institute de Fomento Industrial for the specific purpose of evaluating the country's asbestos deposits. N. H. Hendry, exploration manager of the Canadian Johns-Manville Company, recently spent two weeks inspecting progress of the work, while Keith Conn, chief geologist of Canadian J-M, has spent the past two months on the properties supervising and laying out the exploration program.

Exploration is being carried on in two different locations in the Department, and the two operations are separated by a 10-hour horseback ride. About 70 men comprise the working crew. Investigation has not yet reached the point where success of the venture can be determined.

Tanganyika Orthite Found To Contain Much Hafnium

A deposit of orthite $[Ca_2(Al,R,Fe)_3(AlOH)(SiO_4)_3]$ with which hafnium is associated has been reported in the Tanganyika Territory of Africa. One sample reportedly has assayed at 8.0 percent hafnium.

The orthite deposit is located in a region which just recently has been made accessible to railroad facilities. The size of the deposit is unknown as yet, although it is said to be extensive.

Deadweight Down Payloads Up with

LAKE SHORE MINING EQUIPMENT

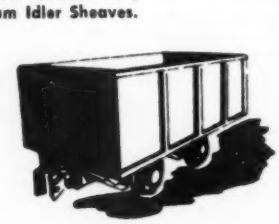
Skips and Cages—all types.

Sheaves—Roller Bearing, Rotating Shaft and Split Type Bicycle Sheaves . . . Cast Iron, Steel and Aluminum Idler Sheaves.

PRODUCTION INCREASES OF 8% and more have been recorded with the installation of Lake Shore engineered mining machinery, like the aluminum and steel Jeto Bottom Dump Skip (above). Lake Shore mining equipment is designed and built by men who know the field, men who know where and how to use weight-cutting aluminum, how to round the corners of tram car for greater rigidity and cleaner dumps . . . men who originated the roller bearing bicycle type head sheave and bell mouth idler sheave.

Lake Shore's experienced engineering is at your disposal either in existing models, or for the design of special machinery your operation may require.

Write today for free CATALOG 450-A.



Mine Cars—Lohed Tram Cars, Granby Type, Self-propelled Trestle Cars, Man Haul Cars.

102

LAKE SHORE Engineering Company

IRON MOUNTAIN MICHIGAN

Look to Lake Shore for Leadership

More Manganese From Philippine Property

General Base Metals Inc., operating on Bohol Island in the Philippines, recently made another shipment of 1,250 tons of manganese ore to Japan. This represented the company's second shipment during 1953 and the 20th since it started operations in 1949. With the acquisition of additional mining equipment and machinery, company officials expect to increase manganese production this year. The firm has an outstanding order of 20,000 tons to be shipped to Japan as soon as possible.

Extensive development of the property is now under way with Norberto Fernandez, a Philippine Bureau of Mines mining engineer, heading a working crew. A group of geologists under the direction of Ramon Abarquez, chief of the bureau's geological division, have completed a four-month geological survey of the property and this data will be used for drilling purposes. Ronald K. Sorem, mining engineer and geologist with the United States Geological Survey, will check results. He recently completed a drilling assignment on ore deposits in Cuba.

Ore dressing tests were recently conducted by a group of experts from the United States Mutual Security Agency and the Philippine Bureau of Mines on the company's low-grade ores. General Base Metals is now considering the installation of a plant as recommended by the results of the ore dressing tests.

DMPA Sets 550,000-Ton Mexican Manganese Goal

The U. S. Defense Materials Procurement Agency has signed five more purchase contracts covering production of 133,500 tons of manganese with Mexican producers. Twelve similar contracts covering production of 416,500 tons were announced previously so the total, and the final total for the present time, is 550,000 tons.

Price to the United States under the agreements is $19.30 per long ton for 25 percent ore, f.o.b., El Paso, Texas. The contracts also provide for premium and penalty payments for ore with higher or lower manganese percentages than 25.

The latest contracts were signed with Elmer Perry, Los Angeles, California; Impulsora Minera, Mexico City; Associated Metals and Minerals Corporation, New York; Cia Minera Anahuac, S. A., Mexico City; and Minas Consolidas, S.A., El Paso, Texas.

Asbestos Mining Proceeds In West Australia Deposit

Australian Blue Asbestos, Ltd. is mining asbestos fiber from deposits at Wittenoom Gorge in the Hamersley Ranges, 700 miles north of Perth in Western Australia. Annual production of the company, an associate of the Colonial Sugar Refining Company, exceeds $1,000,000, in value. Three grades of the blue asbestos are produced: long and medium for spinning and short for asbestos cement manufacture.

SOUTH AFRICA—A survey of South Africa's titanium resources has been completed by the Council for Scientific and Industrial Research (CSIR). The survey is one of several on South African raw materials—others are on the supply of salt and related chemicals, and on the kaolin industry, with special reference to the of possibility of refining local clays.

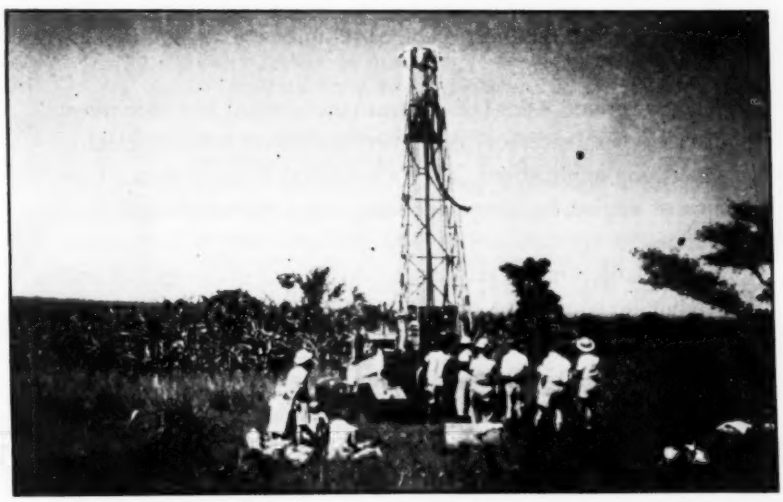
WEST AFRICA—A scrubbing, washing, and dewatering machine has been designed by the Fraser & Chalmers engineering works of the *General Electric Company* to form part of a complete bauxite crushing and washing plant which will be built soon for the *British Aluminum Company*. The machine will handle 100 tons of bauxite per hour.

FRENCH MOROCCO—An 80- to 100-ton pilot asbestos mill is being erected by the *Society Minier Sirocia* to treat its high-grade chrysotile asbestos ore. The ore is about nine percent long fiber and 35 percent crude. The crude is to be hand-cobbed, with the balance milled by a special impact crusher and screens. Fiber will be removed by a vacuum. Two 150-hp. Diesel generators will provide the power for this remote operation which is about 50 miles from the Sahara Desert and about 20 miles from the nearest road.

NORTHERN RHODESIA—The *Rhokana Corporation* has put into operation at its No. 2 ventilation shaft the first large, vertical-type, axial flow ventilation fan to be erected in Southern Africa. This is a complete departure from all other fans installed in the mine. It is flexible, efficient, and requires no bends. The air is drawn straight out of the mine and into the atmosphere. Air which is now available in the different sections of Rhokana's operations are as follows: Mindola—660,000 cubic feet per minute; Nkana—770,000 cubic feet per minute; South Ore Body—at present, 250,000, later, 500,000; Total for the mine—1,930,000 cubic feet per minute.

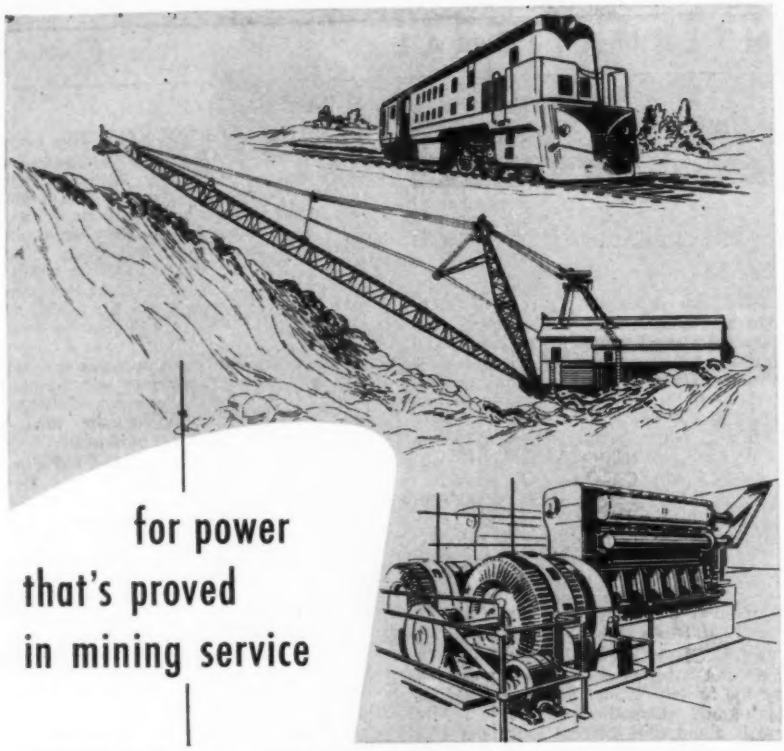
SOUTH AFRICA—*Consolidated Murchison (Transvaal) Goldfields and Development Co., Ltd.* produced 12,958 short tons of antimony concentrates and cobbed ore during 1952 and 7,436.52 ounces of fine gold. The stock of cobbed ore and concentrates on hand at the mine at the end of the year amounted to 4,879 short tons. The Gravelotte Shaft was deepened to the 14th level during the year, and development was done on the 10th and 12th levels to test the continuity of the payable ore shoots below the 7th level. Antimony mining was curtailed for a while, but ore from the Gravelotte Section is now being treated and will continue until a stockpile of concentrates and cobbed ore of sufficient proportion has been built up. At that time it will be decided, on the basis of future sales, whether to continue the treatment of the antimony ores.

NIGERIA—*Kaduna Prospectors Ltd.* produced 77 tons of shipping grade tin



TORORO PROSPECT DRILLING IN UGANDA

The photograph above shows United States and British geologists checking prospect drilling for pyrochlore and apatite undertaken by the Tororo Exploration Company in the Sukulu Hills east of Entebee, Uganda, Africa. To the right of the drill are Paul Sharpstone, vice president of Frobisher, Limited; Allan Anderson, engineer for Frobisher; Lyle Shotwell, Idaho driller; and Charlie Johnston, Monsanto Chemical Company geologist. The truck-mounted Portadrill puts down 130 feet of hole per day with a fish-tail bit. Compressed air blows out the cuttings for a sample. Cost is one-sixth of that of diamond drilling. Pyrochlore ($NaCaCb_2O_6F$) and apatite ($Ca_5[PO_4]_3$) were originally found in small circular hills of limestone (carbonatites) standing above the nearly level plain. Tororo was formed by Rio Tinto Company, Monsanto Chemical Company, Frobisher, Limited, and the Uganda Development Corporation for exploration of the deposits. Dr. P. J. Shennon, consulting geologist of Salt Lake City, Utah, has made two trips to the area for the new company.



for power
that's proved
in mining service

ATLAS and SUPERIOR DIESELS

These sturdy diesels have been proved in service in every climate, under the most severe operating conditions. They're being used every day for drilling, power generation, transportation and hundreds of other requirements in mining and related activities.

Superior and Atlas Diesels are manufactured in a wide range of sizes, with accessory equipment for direct drive or electric generating applications. They are backed by more than a century of engine building experience, and by the research and manufacturing facilities of The National Supply Company—world's largest manufacturer and distributor of oil drilling and production equipment.

The world-wide sales and engineering organization of National Supply's Engine Division is prepared to advise and assist in the selection of Atlas and Superior Diesels for every purpose. Address inquiries to the office listed below, outlining horsepower requirements and application details.

ENGINE DIVISION

THE NATIONAL SUPPLY COMPANY

GENERAL SALES OFFICES
SPRINGFIELD, OHIO

Superior ENGINES ATLAS DIESEL ENGINES

DIESEL ENGINES
DUAL FUEL ENGINES
GAS ENGINES

Distributor of Lister Diesels in the U. S. A.

concentrate during 1952, 52 tons coming from ore reserves and 25 tons from outside. Ore reserves at the end of the year amounted to 247 tons. Costs increased partly because of increased wages and additional amenities for the African workers. *Kaduna Syndicate Ltd.*, reporting for the same period, produced 271 tons of shipping grade—172 tons from ore reserves and 99 tons from outside. Ore reserves at year's end were 1,101 tons. This firm's costs also increased for the same reasons specified above.

SOUTH AFRICA—*Federale Volksbeleggings Beperk* and *Bonuskor* have established an Afrikaans mining company—*Die Federale Mynboumaatskappy Beperk*—to develop base metals. The new firm has a nominal capital of £1,000,000.

GOLD COAST—Electrical resistivity surveys have been carried out during a large-scale search for manganese in the Nsuta area of the Gold Coast. A report on these findings has been made by B. Summers of *African Manganese Co. Ltd.*; the account is published in "Colonial Geology and Mineral Resources," Vol. 3, No. 3.

NORTHERN RHODESIA—Production of electrolytic copper is growing rapidly in this colony. Exports in 1952 amounted to 109,742 tons of electrolytic copper out of total exports of 338,114 tons. Electrolytic exports during the first four months of 1953 totaled 49,595 tons out of total exports of 105,871 tons. This is an annual rate of about 150,000 tons of electrolytic exports annually. In addition, *Mufulira Copper Mines, Ltd.* is just getting its electrolytic production into full swing at a rate of about 36,000 tons a year.

SOUTH AFRICA—A total of 431,872 short tons of manganese ore were shipped by the *Associated Manganese Mines of South Africa Ltd.* during 1952. This was 31,573 tons less than the tonnage shipped in 1951, and was due entirely to the shortage of railway cars. Some improvement in this situation has been made, however. The demand for the company's ore is reported as "good" and large tonnages of manganese ore have been sold at satisfactory prices for forward delivery, thus substantially increasing the overall tonnages of the company's contracts for delivery during the next few years. The firm holds mineral leases over an extensive area of manganese-bearing ground in the divisions of Kuruman and Hay in the Cape Province. The lease known as "Blackrock" is held in perpetuity from the state. No final decisions have yet been reached regarding the other mineral leases which are due to expire in November 1960.

GOLD COAST—*Ashanti Goldfields Corporation* reports that it crushed 21,500 short tons of ore during June 1953 for a recovery of 15,000 ounces of fine gold. Development of the Obuasi Reef is being carried on at the No. 16 level where a No. 42 S.W. crosscut assayed 6.9 dwt. over 14 feet. On the No. 10 level in the *Ayeinm* mine, the No. 25 N.E. crosscut showed 16.2 dwt. over five feet; on No. 12 level, No. 111 S.W. crosscut averaged 5.5 dwt. over seven feet.

SOUTH WEST AFRICA—The treatment capacity of the *Tsumeb Corporation Limited's* flotation mill is being expanded. Two new 9-foot by 7-foot ball mills are being added to the mill circuit. One is already in operation and the second should be in operation by the end of the year. Additional flotation

"Traylor-Made" to Produce a Profit

1. The Meehanite* metal frame of box section design provides maximum strength. Uniform metal thickness and annealing in the sand insure castings free from flaws, shrinkage, cracks and checks.

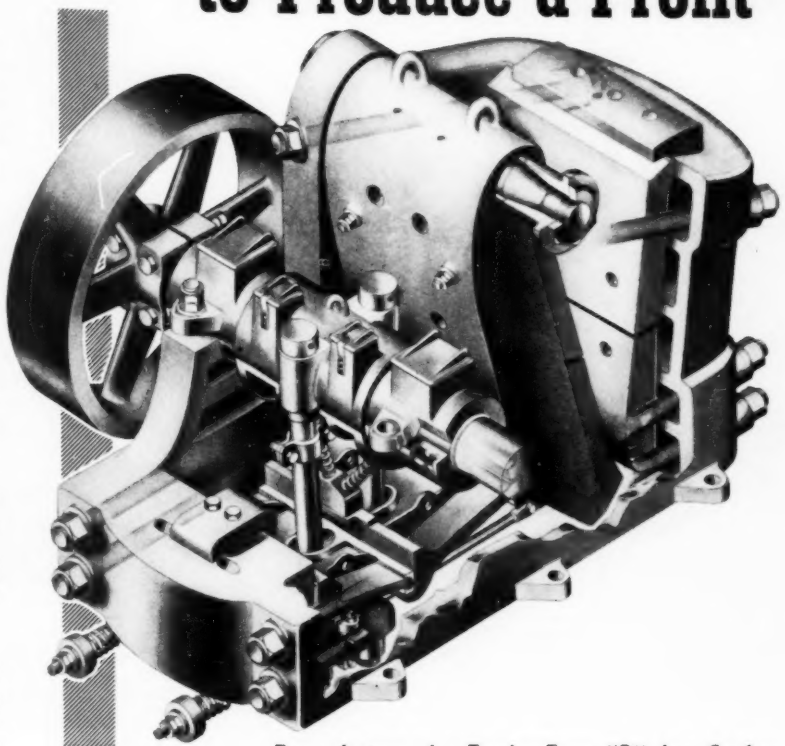
2. Forged steel rods of extra large diameter are an integral part of the very strong pitman which is relatively light in weight.

3. Traylor swing jaw suspension holds the swing jaw shaft in a fixed position. This materially reinforces the top of the frame.

4. Heavy steel reinforcing rods are shrunk in place on each side at the top of the crushing chamber and through the strengthening band at the bottom of the frame.

5. The non-chokable, curved jaw plates of original Traylor design are made of manganese steel. They outwear conventional plates, often by as much as 3 to 1.

*T.M. Reg. U.S. Pat. off.



Every feature of a Traylor Type "R" Jaw Crusher is designed to produce profits for you. Greater hourly tonnages, lower maintenance costs, reduced power costs all add up to more efficient and profitable ore reduction. For over half a century Traylor has been producing heavy-duty crushing machinery designed for service under the most severe operating conditions. For more complete information on "Traylor-Made" profits, mail coupon for free bulletin on the Traylor "R" Jaw Crusher.

Traylor

TYPE "R" JAW CRUSHERS

TRAYLOR ENGINEERING & MANUFACTURING CO.
1553 MILL ST., ALLENTOWN, PA.

Send free bulletin on a "Traylor-Made" Type "R" Jaw Crusher.

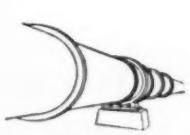
Name _____

Company _____

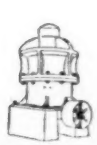
Address _____

SALES OFFICES: New York • Chicago • San Francisco
Canadian Mfrs: Canadian Vickers, Ltd., Montreal, P.Q.

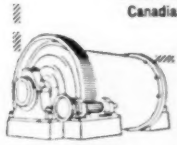
...ary Gyratory Crushers



Rotary Kilns

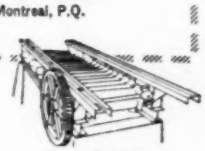


Secondary Gyratory Crushers



Ball Mills

Jaw Crushers



Apron Feeders

Critical Jobs Are Routine For Johnston Pumps!

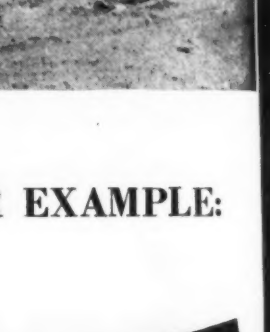
...TAKE THIS FLOATATION MILL JOB, FOR EXAMPLE:

Located outdoors on the steaming hot desert near Hanover, New Mexico, two Johnston Turbine Pumps supply water from deep wells for plant operations, sanitation and human consumption at a 400 ton floatation mill.

In selecting the pumps for this job there were 3 primary conditions: first, the units had to be field-proven for high sustained efficiencies; second, shut-down time for maintenance had to be cut to the bone; third, controls had to be located a considerable distance from the pumps. Johnston not only met all these requirements, but surpassed them!!!

Here are the specifications for the 2 units supplied: 30 H.P., 6 stage, vitriform enameled bowls, bronze closed impellers, oil lubricated column, 300 G.P.M. capacity against a 260 foot head.

This is just another example of the ability of Johnston equipment to handle all kinds of pumping jobs. For the kind of pump "know-how" that puts money in the bank, see your Johnston Dealer, or ask a factory representative to call. They're always glad to help.



Send for your copy of "Water—When You Want It . . . When You Want It". Ask for Bulletin F-93.

JOHNSTON VERTICAL PUMPS

JOHNSTON PUMP COMPANY

3272 EAST FOOTHILL BLVD., PASADENA 19, CALIFORNIA

quipment is also being installed to permit an increase in the capacity to 50,000 tons per month. The new De Witt shaft is being sunk to a depth of 4,150 feet. It has six compartments, the overall shaft dimensions being 8 feet 9 inches by 23 feet 7½ inches outside the steel sets. Opening of the 3,150 foot level, 750 feet below the present lowest level, has been started. A small internal winze was sunk from the 3,150 level to facilitate development. The 3,150 level will be a main haulage horizon with sub-levels at 125-foot intervals between it and the present bottom level of 2,390 feet. All level designations are vertical feet below the shaft collar.

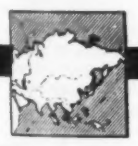
SOUTH AFRICA—The No. 2 shaft of *Loraine Gold Mines Ltd.* has intersected the Basal Reef at a depth of 4,813 feet below the collar. A complete exposure of reef was obtained at the depth of 4,836 feet below the collar. Average value around the shaft perimeter was 21.1 dwt. over an average channel width of 68 inches or 105-inch-dwts. This shaft is about 2,000 feet southwest of borehole No. 2 on the farm Uitkyk 582, in which the Basal Reef was located at 3,790 feet and assayed at 15.5 dwt. over 11.6 inches or 179.8 inch-dwt. Like the No. 1 shaft, No. 2 is a 7-compartment rectangular shaft. Each will have a hoisting capacity of 117,500 tons per month, of which 100,000 tons is estimated as ore. The planned final depth of No. 1 shaft is 5,600 feet and of No. 2 shaft 5,400 feet.

GOLD COAST—Gold Coast production of gold for the first four months of 1953 was 244,592 fine ounces.

BELGIAN CONGO—Production from the mines of *Symetain* in 1952 increased to 5,114 tons of cassiterite SnO_2, from which 3,861 tons of tin were extracted. Also produced were 89 tons of wolframite, and 14 tons of monazite. In 1951, production totaled 5,109 tons of cassiterite; 3,819 tons of contained tin; 106 tons of wolframite, and 36 tons of monazite. Production in 1952 came from the following mines—Kalima-Messaraba 3,388 tons; Punia-Kasese 1,725 tons.

FRENCH EQUATORIAL AFRICA—This country expects to double its diamond production within the next four years. Output will be increased gradually so that by 1956 or 1957 production should reach 400,000 carats per year.

NORTHERN RHODESIA—The rare mineral pyrochlore ($NaCaCb_2O_6F$) has been found at Nkumbwa Hill. Samples are being assayed in London. Pyrochlore is found associated with other oxides of columbium and tantalum. Proportion of these oxides in the Nkumbwa Hill minerals is 73.46 percent, nearly 10 percent higher than any previously recorded. The world's present columbite suppliers are Norway, Belgian Congo, Nigeria, Uganda, Nyasaland, and Germany.



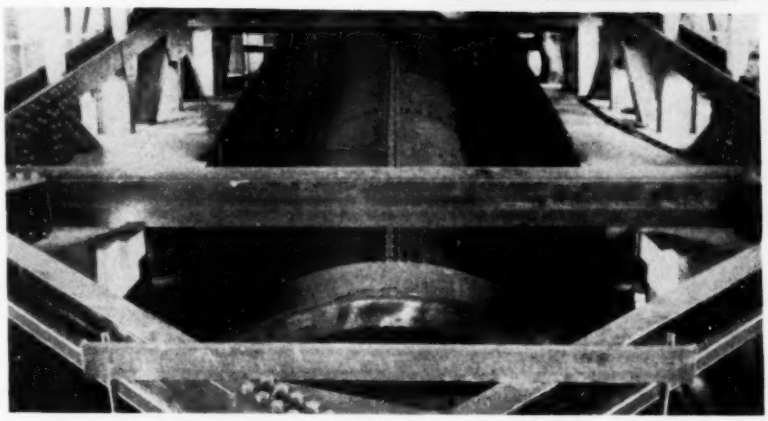
ASIA

INDIA—The Bihar government plans to electrify the mica belt of the state where about 80 per cent of the world's mica is produced. This would cover an area of about 1,000 square miles mostly in the Hazaribagh district. The government has suggested that mine owners

Need Screens or Conveyors

FOR DREDGE MINE OR PLANT?

CONSULT YUBA



ABOVE

YUBA-built revolving screen, 50′ long, 9′ diameter, weight about 65 tons.

AT LEFT

YUBA-built conveyor stacker for conveying rock tailings from revolving screen on YUBA placer dredge to rock piles astern. 44″ belt, 225′ long.

You get long wear, reduce shutdowns for replacement when separating, scrubbing or sizing with YUBA Screens. They're made from Abrasion Resisting Steel* plate, a high carbon, high manganese alloy steel with Brinnell hardness of 200 to 250. Taper drilled holes prevent clogging, can be small and closely spaced for screening monazite sands and other rare earths. Flat or revolving. All thicknesses from ¼" up; other dimensions as needed. Screens with cast manganese steel plates also can be furnished on request.

* United States Steel product

Conveying rock, sand and gravel has been part of YUBA's business ever since 1909. We've built hundreds of heavy-duty conveyors for use on dredges, in pits and at plants. Bring your conveyor problems to us for recommendations and estimates. No obligation. Wire, write or call TODAY.

YUBA DREDGES — PROVED DEPENDABILITY AROUND THE WORLD

YUBA MANUFACTURING CO.

Room 710, 351 California St., San Francisco 4, California, U. S. A.

AGENTS { SIME, DARBY & CO., LTD. · SINGAPORE, KUALA LUMPUR, PENANG.
SHAW DARBY & CO., LTD., 14 & 19 LEADENHALL ST., LONDON, E. C. 3.

CABLES: YUBAMAN, SAN FRANCISCO · SHAWDARBCO, LONDON

The objective for this new potash plant was AS NEARLY AUTOMATIC OPERATION AS POSSIBLE, throughout every phase until the quality-controlled finished product is shipped.

3,000 tons of feed per 24 hours was the capacity sought, and every aspect of production and treatment was scaled to that figure.

Stearns-Roger engineered, designed, and constructed the plant—manufacturing special equipment in its Denver shops.

Early months of operation prove that owner and engineering contractor alike may stamp the project 'Mission Accomplished'

Another typical example of complete Stearns-Roger service to industry, with everything under one contract and responsibility undivided!

Stearns-Roger

THE STEARNS-ROGER MFG. CO. DENVER COLORADO

procure electrical equipment well in advance of the actual power supply date. The first phase of this program has been under way for some time. Power supply was first arranged for the mica town of Jhumri Tilaiya, and to two mines at Sugti and Charki from the Diesel power station of the *Damodar Valley Corporation* at Tilaiya. The program also includes providing power to the Kodarma reserve forest area, Domchanch, Masnodin, and Shibsagar.

PORTUGUESE INDIA—New iron ore deposits are reported to have been located in the southern part of this area and a local firm is said to be developing them. Iron content ranges between 49 and 64 percent.

THAILAND—The *Siamese Tin Syndicate* will buy all of the issued capital of the *Bangrin Tin Dredging Company*. The closer linking of the two companies is expected to bring about a reduction in costs.

INDIA—The Geological Survey of India reports that half a million tons of good quality bauxite are available in the Amarkantak area in Shahdol district of Vindhya Pradesh, and in the contingous region in Bilaspur district of Madhya Pradesh. The deposits are confined within a narrow 15-mile strip and within 80 to 20 miles of the Pendra Road station. The deposits are of fair size and each is reported to be able to feed a plant for at least a few years.

MALAYA—*Idris Hydraulic Tin, Ltd.* produced 322 tons of tin in 1952, considerably higher than in 1951. The increase was due to the higher grade of gravel treated at the Kranji section from 2.33 pounds of tin ore per cubic yard to 3.11 pounds. *Kinta Tin Mines Ltd.* treated a considerably higher amount of vardage but production at 304 tons was 77 tons less than in 1951. This was mainly due to a falling off in the grade of gravel treated at the Damak section. *Tanjong Tin Dredging Ltd.* produced 981 tons of tin in 1952, compared with 1,154 tons in 1951. Production came from the treatment of 4,205,960 cubic yards for a recovery of 0.52 pounds of tin per cubic yard. Previous recovery had been at a rate of 0.95 pounds per cubic yard.

PAKISTAN—The production of vital minerals in Pakistan, though not adequate to meet the country's needs, is constantly increasing. Production of limestone has doubled. Output in 1948 was 346,900 tons. Gypsum production has also doubled from 14,150 tons in 1949 to 28,830 tons. Production of chromite which was 18,000 tons in 1948 drooped slightly to 17,500 tons in 1951 and 17,230 tons in 1952.

INDIA—Operations in the *Kolar Gold Fields* in Mysore State, one of the world's largest gold mining areas, were at a standstill for a short time because of a major power cut. The failure of rains in the region of the Krishnarajasagar reservoir caused a tremendous drop in the water level. This, in turn, affected the Sivasamudram generating station and the Shinsha hydroelectric station. Affected by this shortage were the *Champion Reef, Nandydroog,* and *Mysore* gold mines. The mines are again in operation with the restoration of power.

MALAYA—The *Kamunting Tin Dredging Ltd.* has ceased dredging operations because the ground it was working at Karagan, Kedah, was low grade and losses on monthly returns had occurred. In addition, the recent severe

IDEAS at work...cutting costs

Progress doesn't come by standing still! And many users of P&H Electric Shovels have learned (to their great benefit) of the strides made to cut costs in all kinds of open pit work.

How has P&H done it? Higher electrical efficiency results from equipment designed and built by P&H specifically for electric digging. Stepless power regulation gives smoother operation with none of the old contactor troubles. P&H Magnetorque* Hoist Drive gives you snappier dipper action—lasts the life of the machine. Air-filtered cab protects all electrical equipment. Independent propel permits faster move-ups. All-welded construction of rolled alloy steels provides the husky strength to withstand years of continuous shock loads.

These and many other advancements, still exclusive with P&H, mean steadier, faster digging. That, in the final analysis, means lower tonnage costs. If that's what you're looking for . . . P&H is your answer.

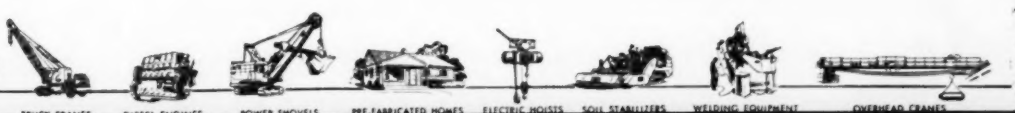
**T. M. of Harnischfeger Corporation for electro-magnetic type coupling.*

P&H LARGE EXCAVATOR DIVISION

HARNISCHFEGER CORPORATION

MILWAUKEE 46, WISCONSIN

P&H *Line*



TRUCK CRANES · DIESEL ENGINES · POWER SHOVELS · PRE-FABRICATED HOMES · ELECTRIC HOISTS · SOIL STABILIZERS · WELDING EQUIPMENT · OVERHEAD CRANES

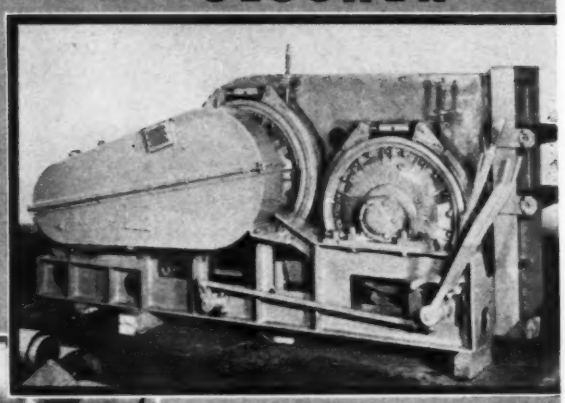
drop in the price of tin had made the situation even worse. The mine plant and equipment are being placed on a care and maintenance basis in the hope that operations may be resumed on another property at a later date.

CHINA—The country's first Five Year Plan is now in operation with the 1953 goal for certain commodities reported as follows: copper, a 39 percent increase over the 1952 total; lead, a 49 percent increase, zinc, 54 percent increase. A program of geological survey is in progress and iron ore deposits are said to have been discovered in north China. Twelve mobile teams have spent two years prospecting for nonferrous metals in northeast China and reportedly have located 3,000 deposits in Liaotung, Liaohsi, and Jehol provinces, of which about 100 are considered to be rich enough for mining.

PAKISTAN—Deposits of chromite have been reported by the Geological Survey of Pakistan in the Upper Punjab Valley of Kharan in the Baluchistan States Union. The area is believed to contain more than 8,300 tons of exposed ore and geological teams now investigating the area may find even more deposits. Specifically, the deposits occur in three places in the region: Punjab Nala, north of Kjaran; Javi Nala; and the Ban area further north. An analysis made at the Quetta Geological Laboratory disclosed 49 percent chromic oxide in the Javi Nala ore and 35 percent chromium on the surface of the Ban ore. This is the second chromium deposit in Baluchistan. The first was located at Hindubagh which provides Baluchistan with about 18,000 tons of chromite per year.

BURMA—The fate of the *Mawchi Mines, Ltd.* is still uncertain. The huge wolframite mines have been held by the rebels since the war. The Burmese government's forces have cleared two rebel outposts and are now within 15 miles of Mawchi, according to reports from Rangoon. Although Mawchi is said to be held by 1,000 well-armed Chinese Nationalist guerrillas and a battalion of Karen rebels, British mining circles feel more optimistic about the situation than they have in years. The Mawchi mines normally produced about 10 percent of the world's wolframite.

only Vulcan-Denver TANDEM SLUSHER



has ALL these advantages

Extra heavy construction provides large mucking capacity and long life.

Large capacity—20,000 lb. rope pull.

Narrow width eliminates necessity for widening drift . . . only 6 ft. wide drift required.

Easy, positive control which operators like.

Easy to assemble and move—dismantles easily into 4 pieces. Mine mechanics like this feature.

Special high slip motor was developed for this slusher.

Special large surface clutch with replaceable drum surfaces provides cool, efficient operation.

New rope roller frame has only two heavy duty rollers and five manganese steel replaceable liners.

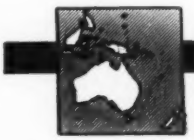
Job proved for 17 years . . . this new slusher is a modification of units which have operated successfully for 17 years.

WRITE FOR DATA

VULCAN IRON WORKS COMPANY

1423 STOUT STREET DENVER, COLORADO

Engineers and Manufacturers of mine hoists, winches, slushers, skips and cages, sheaves, slope rollers, scrapers and chain saws.



OCEANIA

QUEENSLAND—Following reduced output of lead-zinc in May, *Mont Isa Mines Ltd.* showed excellent all-round results in June; lead-zinc ore mined 52,130 tons; lead bullion 3,485 tons; zinc concentrates 3,600 tons; copper ore 30,020 tons; blister copper 1,632 tons. The company's annual production figures for the 12 months to June 30 were: lead-zinc ore 632,765 tons; silver-lead bullion 36,970 tons; zinc concentrates 41,920 tons; copper ore 176,010 tons; blister copper 5,477 tons (smelting started in February 1953).

PHILIPPINE ISLANDS—*San Mauricio Mining Company* handled 9,220 tons of ore during the month of June for a recovery of gold valued at $282,917. This compared with 10,288 tons handled in the previous month for a recovery of $287,871. Operations continue on the north extension of the newly discovered orebody on the Santa Maria No. 2 vein. Work has also been resumed below the Tacoma No. 4 north level, the deepest working thus far.

INDONESIA—During the month of June, the production of tin-in-concentrates in Indonesia totaled 2,890 long tons of fine tin. This was supplied by the three mining firms as follows: *Perusahaan Negara Tambang Timah Bangka* 1,85[illegible] long tons; *N. V. Billiton Maatschappij* 802 long tons; and *N. V. Singkep Tin Exploitatie Maatschappij* 256 long tons. For the period from January to June, production was as follows: Bangka 21,[illegible]931 long tons; Billiton and Singkep 6,0[illegible] long tons.

NEW SOUTH WALES—*Wellington Alluvials Ltd.* reports that its dredge at Wellington has entered better ground. Output in June was 1,411 ounces of gold from 258,000 cubic yards dredged. Costs were 14.5 d (16.9¢) per cubic yard. In the year ended April 30, the dredge handled 3,633,000 cubic yards recovering 11,551 ounces fine gold. Loss for the year was £A15,263.

PHILIPPINE ISLANDS—Three geological survey parties are currently investigating all known copper deposits in the islands for the purpose of preparing an outline of copper deposits which will be used in planning future diamond drill projects. A two-month coal survey was recently completed by Louis Turnbull, coal mining engineer, and Russel Morgan, U.S. coal technology specialist. Both agree that conditions for mining Philippine coal reserves are somewhat difficult with a primary problem being the cost of transportation.

"Eucs" haul big loads at less cost

for your free copy of the new "Estimating Production and Costs erial Movement with Euclids"...it s helpful information for all users the-highway hauling equipment.

More loads per hour and more profit per load with Euclid equipment on the job . . . that's the experience of many quarry operators, open pit mines, sand and gravel producers, and industrial users of heavy duty off-the-highway hauling units. "Eucs" consistently increase production and reduce the costs per ton or yard of material moved.

Bottom-Dump Euclids are engineered and built as complete units with weight distribution that provides better flotation and traction. With payload capacities up to 40 tons and powered by diesel engines of 190 to 300 h.p., these "Eucs" have loaded top speeds up to 34 m.p.h.

Rear-Dump "Eucs" are job proved for economical hauling of aggregate, rock, overburden and other heavy excavation. Powered by diesel engines of 125 to 400 h.p., they carry payloads of 10 to 40 tons at speeds up to 36 m.p.h.

Owners everywhere report longer service life, greater job availability and more production at less cost with Euclids. See your Euclid Distributor for a detailed job study and Euclid cost estimate for your hauling operation.

he EUCLID ROAD MACHINERY Co., CLEVELAND 17, OHIO

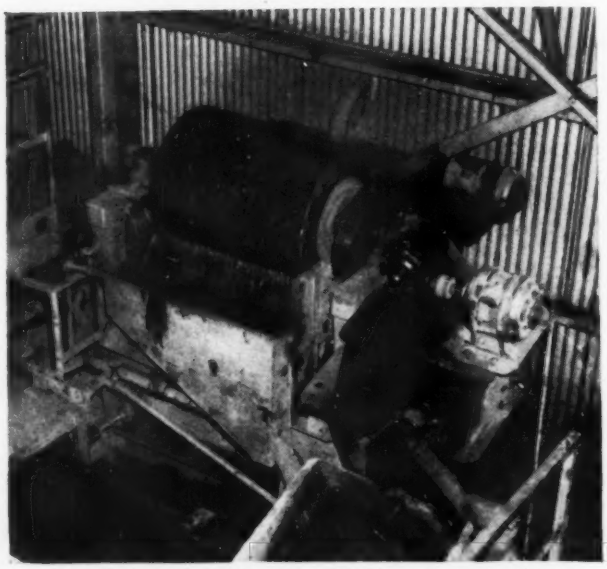
Cable Yuklid—Code Bentley

Euclid Equipment

FOR MOVING EARTH ROCK COAL AND ORE

New Horizons in . . .

MAGNETIC SEPARATION



Installation of Jeffrey Magnetic Drum Separator in a Heavy Media plant treating iron ore.

JEFFREY

— is *pioneering* continuously in the modernization of wet magnetic separation processes.

— is *promoting* exclusively drum-type separators simple, efficient, compact, dependable.

— *introduced* Jeffrey-Steffensen Counter-flow Separators for greatly improved iron ore concentration.

— *originated* Counter-flow units for the ultimate in recovery of magnetic medium in Heavy Media and Cyclone processes.

— is *looking ahead* by developing and improving magnetic equipment to meet the future needs of the mineral industries.

Jeffrey Magnetic Separators Excel

The Jeffrey-Steffensen Counter-flow Separator was scientifically developed on the job for unequaled production of slime-free, dewatered magnetic concentrate of highest possible grade, without the loss of valuable magnetics in the tailing. Available in one, two or three stages to meet the particular requirements of your concentration problem.

Send for descriptive literature and technical performance data.

Jeffrey-Steffensen Two-Drum Counter-flow Magnetic Separator

THE JEFFREY MANUFACTURING CO.

ESTABLISHED 1877

Columbus 16, Ohio

sales offices and distributors in principal cities

PLANTS IN CANADA, ENGLAND, SOUTH AFRICA

IF IT'S MINED, PROCESSED OR MOVED . . . IT'S A JOB FOR JEFFREY!

WESTERN AUSTRALIA—Nine shares in *Hill 50 Gold Mine N.L.* have increased from about four shillings (par) to 84 shillings in the space of a few months. In June the plant treated 7,233 short tons recovering 3,174 ounces of gold but recent development has disclosed much richer ore. Most Australian gold comes from Western Australia so that state will benefit particularly by any price increase. For the four months to April 30, the Commonwealth produced 331,447 fine ounces, a rise of 12.3 percent compared with the same period in 1952. Output in April was 81,832 ounces.

NEW GUINEA—*Bulolo Gold Dredging, Ltd.* has completed incorporation of *Commonwealth-New Guinea Timbers Limited* for the purpose of operating a timber and plywood enterprise in the Bulolo Valley. The Bulolo Gold Dredging firm owns slightly more than a 50 percent interest and the remainder is held by the Commonwealth of Australia. Construction of the main mill building is proceeding according to schedule; orders have been placed for the necessary plant and all machinery is expected to be installed by January 1954. The firm increased gold output by 39,082 ounces the year ended May 31 (49 percent). Cubic yards treated were 16,901,200, value rising by 0.28 cent to 24.54 United States cents.

NEW SOUTH WALES—Tin producers in the New England district are reported to be desperate following declines in overseas metal prices. It was stated at a recent meeting at Emmaville that local producers received less than £A1,000 when parity price was £A2,000, and that now only two plants are in operation where 20 were before.

PHILIPPINE ISLANDS—Chromite production for the *Acoje Mining Company* during the month of June totaled 30,030 tons. *Consolidated Mines, Inc.*, produced 45,000 tons of chromite.

SOUTH AUSTRALIA—*Uranium Development and Prospecting N.L.* has been registered in Adelaide with a nominal capital of £A250,000. The company will explore for radioactive deposits in the Northern Territory.

VICTORIA—*Victorian Antimony Mines Ltd.* at Costerfield reports that tests by the Commonwealth Scientific and Industrial Research Organization on calcines had confirmed separation of 99 percent antimony. Tests are also to be made on cyaniding the calcines for gold.

TASMANIA—*Moina Tungsten Tin Mining Company N.L.* expects to unwater its mine shortly. A. B. McAra has been appointed mine manager.

NORTHERN TERRITORY—For the four-week period to June 17 *Northern Star (Tennant Creek) Gold Mines N.L.* treated 858 tons for a recovery of 233 ounces of gold. The company has entered into an agreement with *Northern Mines Development N.L.* under which the latter company will test the Northern Star leases; the goal is to prove at least £A1,000,000 worth of ore. If successful, reorganization of the Northern Star company is to be effected so that Northern Mines may acquire a half interest.

NEW SOUTH WALES—*Austral Malay Ltd.* is investigating the *Yerranderie* silver-lead field 60 miles west-south-west of Sydney. From 1900 to 1938, 27,000 tons of lead were produced (in concentrate), but very little work has been done in recent years. Ores are generally very high in silver and low in zinc. The lodes are narrow fissures dipping at 24° to 40° to the south.

NORTHERN TERRITORY—*Peko Gold Mines Ltd.* of Tennant Creek expects to earn profits of not less than $800,000 annually when its new gold treatment plant is installed. The company recently made an issue of 2,000,000 shares to finance the installation of the plant. Investigations on the copper ore to date have progressed to a stage where a reasonably high copper and gold recovery can be expected from ore showing above the 300 foot level.

LATIN AMERICA

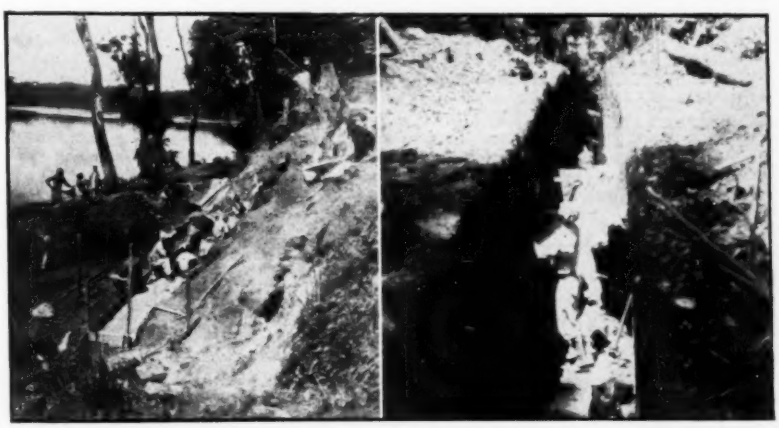
MEXICO—A fire recently destroyed the 50-ton manganese mill erected at Agua Prieta, Sonora, Mexico, by the *Sonora Metal Company*. Loss of milling equipment was estimated at $45,000 by J. M. Borevitz, president of the firm. The company was conducting test runs in preparation for regular milling the following week when the fire occurred.

SURINAM—Bauxite exports for the period from January until May of this year totaled 1,194,000 metric tons, as compared with 1,262,000 metric tons for the same period of 1952. Total gold shipments for the same period totaled 2,296 ounces in 1953, compared with 2,436 ounces in 1952.

CHILE—A *Copper Sales Corporation* has been created by the government to handle the marketing of all Chilean copper, formerly transacted through the Central Bank.

NICARAGUA—*La Luz Mines, Ltd.* milled 433,052 tons to recover 40,373 ounces of gold during the first seven months of its fiscal year (October 1952 to April 1953), compared with 398,523 tons to recover 43,841 ounces in the same period of the previous year. The grade of ore treated was lower because a considerable amount of mill feed from underground was drawn from the low-grade stopes on the 350-foot level of the north section, and also from the open pit whose ore grade was lower than expected. During the year, shaft deepening operations were completed, a pump station cut at the 1,325-foot horizon, and a service raise driven from the station to the new bottom level at 1,250 feet. Stations were cut at the 1,250-foot and 1,000-foot levels; a crusher station and loading pocket were also cut and deep mining should get underway within eight months.

COLOMBIA—Under a new government, high hopes for a mining revival in Colombia are apparent. With the restoration of law and order, small miners will again venture out to prospect, while the larger companies can expand and simplify operations without the harassment of guerrilla activity.



SURINAM SAMPLES ITS MINERAL DEPOSITS

The Surinam Geological and Mining Service (GMD) has been sampling deposits along the Surinam River. The photograph at the left shows a beryl deposit at Rama where the Beryl-bearing pegmatite lies in mica schist near the contact with a granodiorite. The Rama beryl, the first to be reported in the country, was discovered by GMD Director H. Schols in 1946. The Billiton Company Ltd. is reported to be showing interest in this region, while mining geologist C. Smith representing the Beryllium Company of Pennsylvania has visited both Rama and another beryl deposit near Herminadorp on the Marowijne River. It is believed that more beryl-bearing pegmatites may be found within a 130-kilometer zone running from Herminadorp to about 25 kilometers west of Rama. The photograph at the right shows asbolan (a cobalt, nickel, and copper-bearing manganese oxide) being sampled by the GMD in a 260-foot long trench at Brokopondo. The mineral is found as a black amorphous earthy powder in quartz veins and in little fissures in a completely weathered metamorphic rock of pre-Cambrian age. It was discovered in 1951 by GMD geologists F. C. d'Audretsch and C. Bleys during a geological survey for the Brokopondo hydroelectric project. The occurrence has been further tested by the Billiton Company Ltd. with samples sent to The Netherlands for analysis.

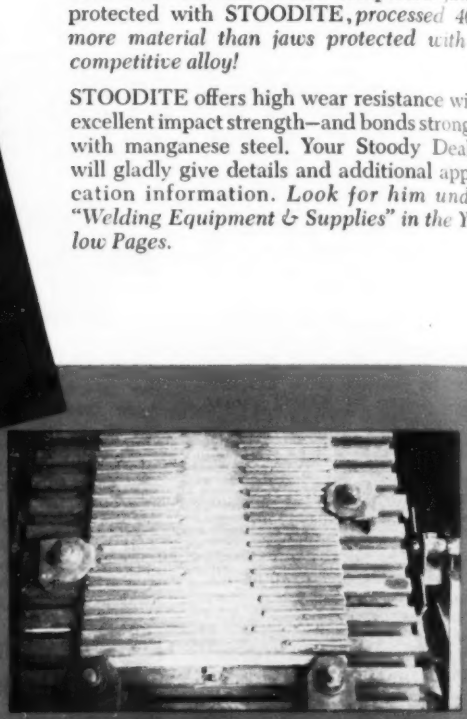
WARPAGE CONTROL...

KEY TO HARD-FACING CRUSHER JAWS!

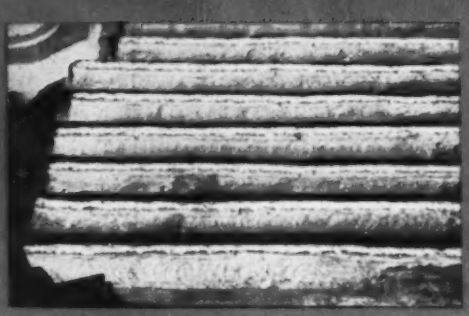
WHAT makes for success in hard-facing crusher jaws? Two major factors: Choice of the right Stoody Alloy and control of warpage during welding operations! Here's a procedure in use today giving quick buildup, excellent wear protection and relative freedom from distortion. The completed jaws, protected with STOODITE, *processed 40% more material than jaws protected with a competitive alloy!*

STOODITE offers high wear resistance with excellent impact strength—and bonds strongly with manganese steel. Your Stoody Dealer will gladly give details and additional application information. *Look for him under "Welding Equipment & Supplies" in the Yellow Pages.*

1 Heavy welding jig is essential. This one is composed of railroad irons welded together, with rails furnishing top surface. Table can be tilted to facilitate down-hand welding on corrugations.



2 Jaw is securely clamped on table. Manganese bars are tacked in sections with Stoody Manganese along worn corrugations. Bars build up size quickly; sections permit skip welding which equalizes heat, lowers distortion.



3 Sides of corrugations are built up with Stoody Manganese. Stoodite stringers bring top to sharp vee. Sides of corrugations are then surfaced with Stoodite. Skip welding is necessary.

4 Warpage is checked with straight edge on back side then shrink welds are applied along webs to equalize tension. Occasional checking with strap-iron fixture indicates progress. Finished jaw is flat within 3/32".

STOODY COMPANY

11969 EAST SLAUSON AVENUE • WHITTIER, CALIF.

CHILE—Operations were suspended for a time at the *El Teniente* mine of the *Braden Copper Company* when miners in the ore extraction section stopped work in protest against the dismissal of some of the employes.

BRAZIL—Under an agreement with Czechoslovakia, Brazil is expected to supply 20,000 tons of iron ore from the *Vale do Rio Doce* deposits.

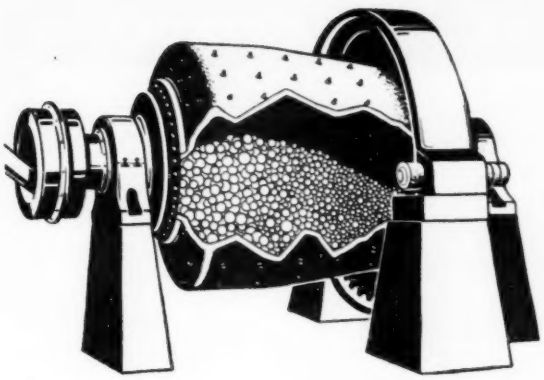
CHILE—The *Chile Exploration Company*, a subsidiary of *Anaconda Copper Mining Company*, has increased its term bank loans from $60,000,000 to $85,000,000. The loans, guaranteed by Anaconda, are to help finance the project at the *Chuquicamata* copper mine. The increased borrowing is at the rate of 3¾ percent interest.

SURINAM—Dredging of the Cottica River has been completed. Ocean-going ore carriers will now have a better navigable route from the *Moengo* bauxite mine to the open sea.

COLOMBIA—*Pato Consolidated Gold Dredging, Ltd.* reports that the work of converting No. 3 connected bucket-line dredge to a digging depth of 81 feet below water from its original 67 foot-limit has been completed and operations are proceeding satisfactorily at the increased digging depth. For the first five months of this year, recoveries continued at a high level with 6,597,400 cubic yards of gravel dredged for a recovery of 65,296 ounces of gold. During last year, *Asnazu Gold Dredging, Ltd.* added 5,822,700 cubic yards to its reserve. The increased yardage is expected to extend the life of No. 1 dredge slightly and should make it possible for No. 2 dredge to continue operating at a profit until about April 1954. For the five months of this year, the dredges handled 2,671,100 cubic yards of gravel for a recovery of 1,820 ounces of gold. For this same period, *Nechi Consolidated Dredging Ltd.* handled 1,609,000 cubic yards of gravel to recover 6,239 ounces of gold. Nechi is being amalgamated with Pato.

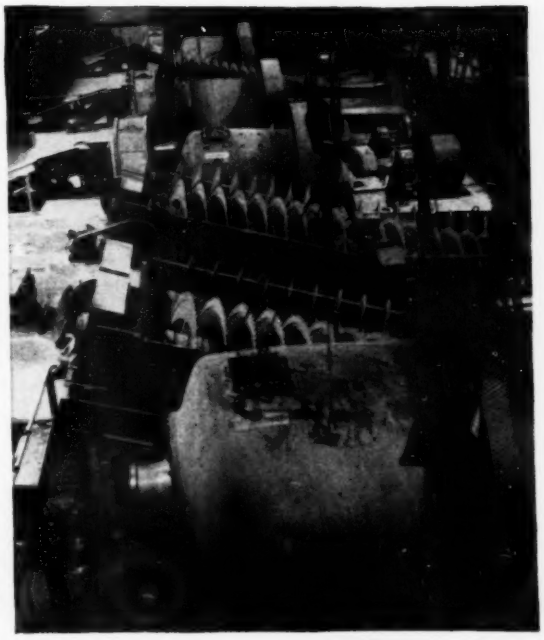
BRAZIL—Discovery of a uranium mine has been reported in Minas Gerais state, near the famous *Morro Velho* gold mine, the *Companhia Morro Velho* which owns the uranium mine has already started mining operations. Uranium has also been located at Araxa in the same state. The ore is said to be very complex, and to contain thorium and niobium. According to the technicians, this mine is considered to be the best in the country. Uranium research is also going on in the Pocos de Caldas region of the state.

CUBA—To provide additional ore reserves for the United States government-owned nickel plant at Nicaro, the Defense Materials Procurement Agency has been systematically exploring for other deposits. About half completed at present, the survey has so far proved up 12,000,000 tons of nickeliferous ore in the foothills of the Sierra del Cristal and the Sierra de Nipe near Nicaro. The continuing search, under the U. S. Bureau of Mines, is expected to increase reserves to about 20,000,000 tons in newly proven orebodies. Title to the new reserves is being acquired by the *Cuban Nickel Company*, a Cuban corporation with its stocks held by the United States. The plant is presently being fed from reserves owned by the *Freeport Sulphur Company* through a subsidiary, *Nicaro Nickel Company*, which operated the plant during the war and for a short time thereafter. The *Nickel Processing Corporation*, jointly



TRICONE MILLS

The Hardinge Tricone Mill is ideal for large tonnages because of its design. The tapered barrel causes correct ball alignment, conserving grinding energy. The Tricone Mill occupies less floor space for a given grinding volume than any other mill ever built and overall power consumption is reduced 5% by new design bearings. A grate may be added when more capacity is required but the wear of balls is minimized because only small balls come in contact with the grate. Bulletin AH-414-3.



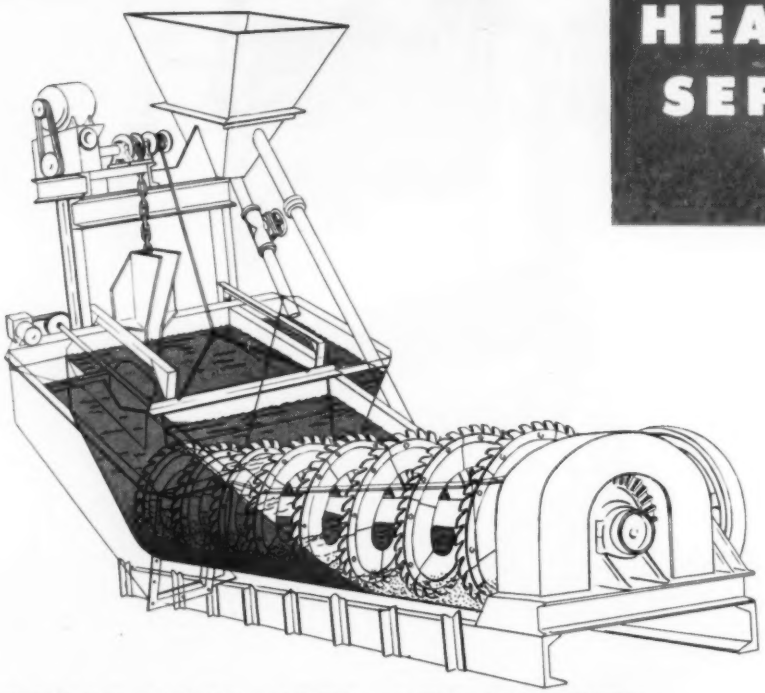
Four 11′ diameter Hardinge Tricone Mills at Barvue Mines, Ltd., Barraute, Quebec, grinding more than 5000 tons of zinc ore daily.

HARDINGE
COMPANY, INCORPORATED

YORK, PENNSYLVANIA · 240 Arch St. · Main Office and Works

New York · Toronto · Chicago · Hibbing · Houston · Salt Lake City · San Francisco

PROVED ADVANTAGES of AKINS HEAVY MEDIA SEPARATORY VESSEL



LARGE POOL AREA AND VOLUME

Facilitate Better Recovery of Values from Fine Sizes

The Akins Separatory Vessel has more pool area and volume per ton capacity than other types of vessels. This results in several distinct advantages:

Longer retention time which, combined with a quiet and deep pool, allows full settling of the sink even from the fine sizes . . . thus giving a better recovery.

Submerged feed assures separation of density fractions.

Baffles may be used, with this large pool area, if it is desirable to have definite zones of separation, and to prevent the formation of islands of displaced density fractions.

OTHER OUTSTANDING ADVANTAGES OF AKINS

Entire vessel is visible and accessible.
Variation in feed rate or grade of feed is not detrimental.
No intermixing of sink and float in product discharge.
Circulation of media at lower gravity and viscosity.
Gradation of gravity and viscosity from feed entry point to sink removal point provides natural cleaning of sink.
Three product separation in one machine

COLORADO IRON WORKS CO. CIW

Akins — the ORIGINAL spiral type classifier.

COLORADO IRON WORKS CO.

1624 17th Street • Denver 2, Colorado

AKINS CLASSIFIERS • SKINNER ROASTERS • LOWDEN DRYERS

Sales Agents and Licensed Manufacturers in Foreign Countries

A SUBSIDIARY OF THE MINE & SMELTER SUPPLY CO.

ned by the *National Lead Company* d Cuban interests, is presently op- ating the plant.

VENEZUELA—The *Orinoco Mining ompany*, a *U. S. Steel Corporation* sub- diary, will be the first to use microwave nsmission for the operation of rail- ad switches, signals, and interlockings the 90-mile railway now under con- uction to haul iron ore from the *Cerro olivar* mine to Puerto Ordaz. The micro- ave installation eliminates the cost of onstructing line wires and their asso- iated maintenance. The equipment was eveloped by the Union Switch & Signal Division of the *Westinghouse Air Brake Company*, in cooperation with the *Radio Corporation of America*. It is expected to be in operation when the railroad is completed this fall.

ARGENTINA—Exploration work is continuing in the district of Bajo de Valcheta in the Rio Negro territory with favorable results. Important occurrences of fluorite, limestone, and salt have been located. The principal fluorite deposits considered worthy of development are called *Chanquin-Macachines*. The *Punta de Agua* deposits may also become an important source of fluorite. Some veins have an average width of 1.80 meters, running as high as 6 meters, with ore assays reaching 82 percent. First esti- mates calculate the ore reserve at 100,000 tons. The travertinic limestone occurring in the zone has an average width of 2 meters, with calculated reserves of 100,- 000 tons. The salt deposits contain bromine and iodine.

BRAZIL—A new steel mill, planned for an eventual capacity of 400,000 tons of finished products per year, is to be con- structed at Vitoria in the State of Espirito Santo. Initial production will be about 30,000 tons of finished products per year, with the final goal achieved within four years. Capital is being supplied by Bra- zilian interests and the *Koeckner* group in Germany. Iron ore will come from Itabira, and power will be supplied by the Rio Doce power plant.

ARGENTINA—A study of the copper resources of the country has brought some encouraging results. However, there is only one copper refinery in the country (*S.A. Electroquimica Mendocina*), which is located in Mendoza. This small plant produced electrolytic copper (99.97 per- cent) and other byproducts. The report recommends the installation of three small plants in Chilecite, Jachal, and Ma- largue in the provinces of La Rioja, San Juan and Mendoza, respectively, where copper ore exists and is mined by small operators.

NORTH AMERICA

BRITISH COLUMBIA — *Bralorne Mines Limited* milled 92,653 dry tons of ore during the six-month period ended June 30, for a recovery of 36,536 ounces of gold. Development of the "77" vein eastward from crosscuts on the 22nd and 23rd levels has produced good results and has proved the continuity of high- grade ore found on the 21st and 24th levels; 19,716 tons averaging 0.70 ounce were developed during April and May. Preparatory work is being undertaken to prove the extension of the "77" vein be- low the 26th level. Prospecting for the "53" vein on the 24th level has been hampered by bad ground. A crosscut on the 20th level has been advanced 506 feet. This crosscut is being driven to ex- plore the ground of Bralorne's subsidi- ary, *Taylor (Bridge River) Mines Lim- ited*. At the company's *Gray Rock* prop- erty, diamond drilling and drifting are underway. Surface exploratory work is also being carried out on the *Lustdust* property optioned by Bralorne. Values are in gold, silver, lead, and zinc.

SASKATCHEWAN — *Tetra Uranium Mines Limited* has started a surface ex- ploration program on its nine-claim prop- erty in the Beaverlodge area, adjoining on the south the *BT* group of *Beta Gamma Mines*. Tetra has also acquired four other uranium properties. In Quebec the company holds two groups in Mai- sonneuve Township, one of which ad- joins *South State Uranium Mines* where samples have indicated uranium values. In Ontario, the company has six claims in the Wilberforce area of Haliburton County where the first sample assayed 2.06 percent uranium oxide. In the North- west Territories, Tetra holds the *Nest* group of six claims at the south end of Hottah Lake.

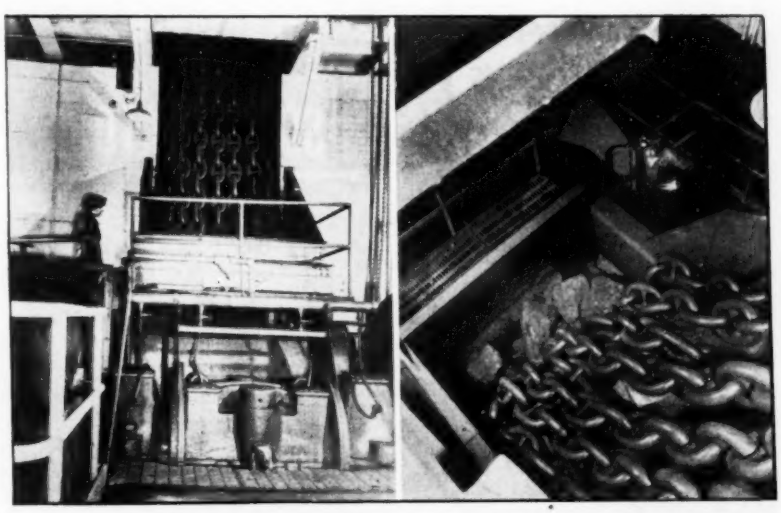
ALASKA—A rich uranium discovery is reported to have been made on Bear Creek on the Seward Peninsula. Jones and Straub discovered a vein two feet wide leading directly into Granite Moun- tain. Because of the remote nature of the country, equipment has been dropped from an airplane. The claims were re- corded at Candle, Alaska, in the Fair- haven mining district.

ONTARIO—Drilling operations on *Peach Uranium & Metal Mining Lim- ited's* property in Long Township were suspended for a time while additional staking was completed. Regular drilling is under way now, however, with sev- eral radioactive mineralized bands being intersected.

UTAH—*Salt Lake Tungsten Com- pany*, an affiliate of *Minerals Engineer- ing Company* and *Sylvania Electric*, has completed construction of a $300,000 tungsten refining plant and expects to process about 200,000 tons of tungsten oxide monthly. Blair Burwell, president of Minerals Engineering, is also president of Salt Lake Tungsten.

SASKATCHEWAN — *Clix Athabasca Uranium Mines Ltd.* has initial field work in progress on its 1,640-acre property south of Beaverlodge Lake. A seven-man crew is now engaged in survey line cut- ting, and detailed mapping work prep- aratory to diamond drilling. A large area has already been mapped north of Grif Lake.

ALASKA—Alaska is experiencing one of the driest seasons known to the min- ers. This is expected to raise havoc with the recovery of the Territory's most im- portant mineral—gold—as nearly all Alaskan gold recovery operations are of the placer type. The water shortage is generally attributed to the light snow-



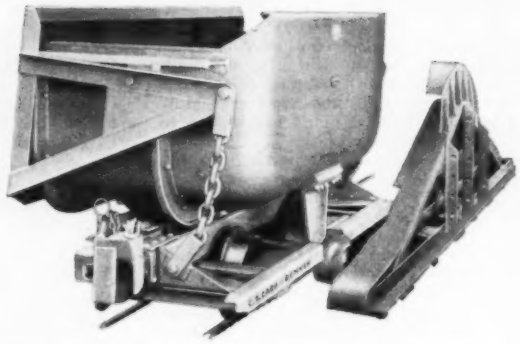
GIANT JAW CRUSHERS HANDLE NICKEL ORE

The massive crusher shown above is one of five recently installed by the International Nickel Company of Canada, Ltd. in its Creighton and Frood-Stobie mines in northern Ontario, as part of the company's underground mining expansion program. The powerful machine (left), weighing 185 tons, crushes about 500 tons of ore an hour, reducing it to eight-inch chunks. Ore dumped from haulage cars at the underground tipple rumbles down a chute leading to the crusher, which has a swing jaw weighing 18.75 tons. The speed of the ore feed to the crusher is regulated by seven huge chains (close-up right) with 110-pound links and a total weight of 14.50 tons. After passing through the crusher, the ore is ready for hoisting to the surface for further processing. The stations housing the many underground crushers in opera- tion at International Nickel's mines are located from 500 to 5,000 feet below the surface. Each station is lined with reinforced concrete and the back is supported by heavy steel beams.

Lower Mine Haulage Costs

are in the

CARDS



Card cars are available engineered to your individual requirements. Before you settle on misfit equipment because it's "standard," let us quote on your *exact* needs. On the basis of cost per ton-mile haul, *Card* equipment saves you money.

Our 60th year of service to the mining industry

C.S. Card Iron Works Co.

2501 WEST 16TH AVE.
DENVER, COLORADO

Kleenslot VIBRATOR SCREENS

They can be DESIGNED AND ADAPTED TO FIT ANY MAKE OF VIBRATOR. Perfect separation on wet or dry screening. Accurate performance on hundreds of installations.

HERE'S HOW IT'S DONE

Cross section at left shows how KLEENSLOT Screens operate on a non-clogging principle.

Kleenslot SCREEN GUARDS

The screen guard is built into the screen and the guard bars permit only the finer particles to pass over the screen. All sizes and most materials furnished.

SEND FOR OUR ILLUSTRATED LITERATURE

Wedge-Wire CORPORATION
5600 CLARK AVE. CLEVELAND 2, OHIO

PRECISION RADIATION INSTRUMENTS
TAKES PRIDE IN
ANNOUNCING THE
"SCINTILLATOR"*

*PATENT PENDING

MODEL 111
Portable Scintillation Counter

• Made in the U. S. A. by Precision • 100 times the sensitivity of the best Geiger Counter • Suitable for aerial surveys or surveys from moving vehicles • Accuracy within 5% of ¾ full scale reading • Uses latest type RCA 6199 photomultiplier tube • Uses newest simplified circuit • Used by U. S. Geological Survey and the Atomic Energy Commission • Waterproof and tropicalized probe • Weigh only 6¼ lbs. Probe 2 lbs. • Only two simple controls • Long battery life • Ranges .025, .05, .25, 1, 5 and 25 MR/HR.

Price complete only **$495.00**

Write for free catalog on the "Scintillator" and our complete line of Geiger Counters and metal locators.

DEALER INQUIRIES INVITED

PRECISION RADIATION INSTRUMENTS
2235 MWD South La Brea Ave., Los Angeles 16, Calif.

fall last winter. Most of th miners we hampered in their operatio during la and spent the time clear g brush a doing other preparatory wo while wa ing for water. Among tho affected b this drought are Gus Bec from on t *Idaho* property in the C icken Cre area and Pat Savage in the same distri

ONTARIO—Following a tune-up p riod, *Barvue Mines Ltd.'s* new mill treating higher grade ore. From Janua 1 to April 30, mill heads averaged 3 percent zinc and 1.15 ounces silver p ton. Now that mining is below the su face oxidation in the open pit, head equal the original estimate of 3.27 pe cent zinc and 1.13 ounces silver per to Operating costs are decreasing with h average figure by May of this year dow to $1.82 per ton. See MINING WORLD March 1953, for a full report of Ba vue's new operation.

NORTH CAROLINA—Mica grindi plants are now running at full capacit in the Spruce Pine district, with opera tions on a 24-hour, six-day-per-week ba sis.

NORTHWEST TERRITORIES—Ma chinery, equipment, and supplies ha been shipped to the *Rankin Inlet* Nicke *Mines Limited's* property at Rankin Inle where a 300-foot shaft will be sunk t open up the known ore-body on tw levels. Exploration for additional ore wi be undertaken by drilling from under ground. *Temiskaming Construction Ltd.* has been engaged to design, procure, and install a mining plant. Preliminary survey of the property have been made and a small crew with portable machinery ha already collared the shaft, now sunk to depth of about 35 feet. The sinking pro gram will take until the summer of 195 to complete and will cost about $900,000.

LABRADOR — A 2,300-square-mil mineral concession has been granted t *Canadian Javelin Foundries and Machine Works Ltd.* for a $1,000,000 explorati program at the south end of the famou Labrador iron trough. The concession i part of the 4,775-square mile concessio held by the *Newfoundland and Labra dor Corporation* (a government-financed development corporation set up by the Newfoundland government in 1951) Javelin has taken over the expenses of two Newfoundland and Labrador Cor poration exploration teams which are al ready in the field.

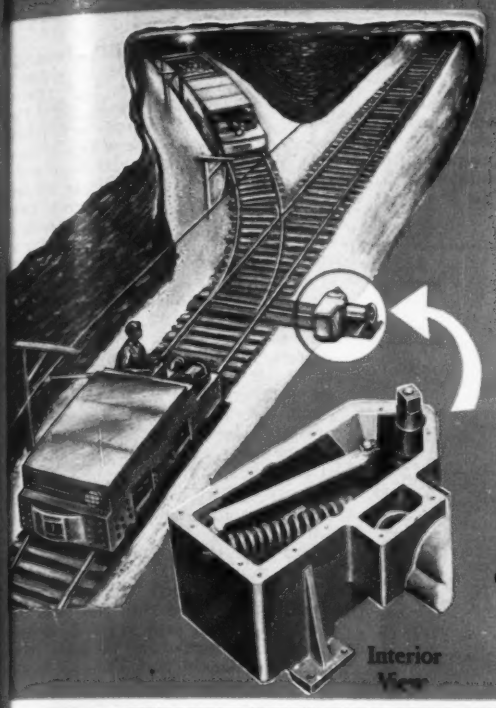
BRITISH COLUMBIA—Discovery of uranium-bearing pitchblende in the Lake Atlin area 20 miles south of the Yukon-British Columbia border is said to have started a uranium rush for claims. More than 350 claims are reported to have been filed at Atlin already. Each perso is limited to eight claims over a 10-mile area. The discovery was made by a team working for *Conwest* Exploration *Company.*

NEW BRUNSWICK—Diamond drill ing on the group of claims owned jointly by *St. Joseph Lead Company's* wholly-owned subsidiary *Leadridge* Mining *Company Ltd.* with *Anacon Lead* Mines *Ltd.* near Bathurst has indicated sub stantial tonnages of silver, lead, zinc and copper. Active exploration work is continuing on these claims and other holdings in the other area.

NORTHWEST TERRITORIES—Con solidated *Discovery Yellowknife* Mines produced a total of 16,399 ounces from 15,871 tons of ore milled during the first six months of this year. Millheads

Electri-Throw—DEPENDABLE SWITCH THROWER

SAVES LIVES—
...eliminates costly accidents



Interior View

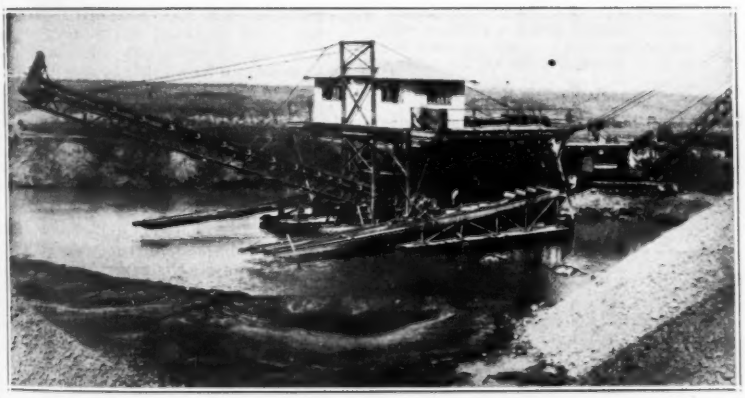
Greatest number of trips in a given time is accomplished by the "Canton" Automatic Switch Thrower. This eliminates stopping for switch to be thrown, saves labor, and *eliminates* that *accident potential*. For further safety, *signal lights show position of points*, if blocked or split. All *flashing* and *sparking at points* of contact with trolley wheel are *eliminated*. This unit is as nearly foolproof as is possible. Constructed on the solenoid principle in combination with patented automatic cutout, actuating mechanical connection to the Track Switch, instantly throwing the switch points against the rail on either side of track. Can be used as an automatic derailer, *protecting life and property* . . . operated usually by the motorman while traveling full speed ahead.

Write for complete descriptive catalog, using street and zone numbers.

Manufacturers · Safety Signal Systems · "Dustributors"
Automatic Doors · Car Transfers
Cable Splicers and Vulcanizers · New Mechanical Track Cleaners

American Mine Door Co.
2071 DUEBER AVENUE, CANTON 6, OHIO

Lower Costs Mean Higher Profits with a BODINSON DRAG LINE DREDGE



Consult Our Engineers—as designers and constructors of hundreds of successful drag line dredges, they will be glad to advise you on your problems.

Low first cost.

Low operating cost.

Low transportation cost.

Capacities range from 1,000 yds.. to 15,000 yds. daily.

Can be sectionalized for shipment to remote areas.

Recovery systems can be either jigs or riffles—to suit conditions.

If you have the property we suggest that you get your equipment lined up now.

DRAGLINE DREDGES
DRY BANK PLANTS

Our new illustrated catalog will be out soon—ask for your free copy.

BODINSON MANUFACTURING CO.

"World's Largest Builders of Dragline Dredges"

Ask for free literature, facts and prices on Bodinson rock, gravel, asphalt and concrete batching plants . . . plants of all types . . . material-handling machinery . . . belt conveyor systems . . . conveyor accessories, bucket elevators, power transmitting equipment.

2401 BAYSHORE BLVD. Phone JUniper 5-9641 SAN FRANCISCO 24, CALIF.

averaged 1.07 ounces of gold per ton and recovery was 97 percent. This compared with 18,142 ounces, 16,819 tons, 1.10 ounces and 97.3 percent recovery in the first six months of last year. Current development work is concentrated on the new 1,100-1,250, and 1,400-foot horizons. A shaft crosscut on the 1,400 level is just reaching ore, and this work coupled with horizontal drilling, has picked up both the North Zone and the No. 4 vein, as well as two other occurrences. Later this year, plans call for resumption of shaft sinking to the 2,000-foot horizon to open four new levels.

ONTARIO—*Nickel Offsets Ltd's* new 300-ton concentrator has been completed. A contract with *Falconbridge Nickel Mines Ltd.* for the sale of concentrates calls for deliveries to begin this month. Termination date is September 30, 1957 or when at least 10,000,000 pounds of recoverable nickel have been delivered. Ore reserves for Nickel Offsets are estimated at 303,754 tons having an average grade of 1.77 percent nickel and 1.31 percent copper. The tonnage is contained in four ore shoots which are currently being prepared for production.

IDAHO—*Anaconda Copper Mining Company* has started an open-pit mining program at its Conda, Idaho property for phosphate. Dry rotary prospect drilling is under way and overburden stripping is being carried out by the *Morrison-Knudson Company.*

SASKATCHEWAN—Following completion of geological mapping, *Lake Uranium Company* has started Geiger counter survey and surface exploration of its holdings in the Beaverlodge Lake area. All survey line cutting has been finished and camps have been erected.

BRITISH COLUMBIA—Preparations for development of the 12 claims acquired by *Allied Mines, Ltd.*, from *Allied Mining and Development Company, Ltd.* are under way, with rehabilitation of the camp one of the first items. The 50-ton mill will also be placed in operation soon. Arrangements are being made for the sale of 3,000 tons of galena-barite which are on hand. Reserves are estimated at 26,000 tons containing values in silver, lead, and zinc.

YUKON TERRITORY—*Mayo Mines Ltd.* plans to form a new company, *Maybrun Mines Ltd.*—to take over all of its assets and liabilities. The company reportedly needs substantial funds to carry out its various development plans on property in the Yukon, Porcupine, Sault Ste. Marie, and New Brunswick areas. Exchange would be on the basis of one new share for every three old shares.

SASKATCHEWAN — New mining equipment and power facilities are being purchased by *Rix Athabasca Uranium Mines Ltd.* to meet production requirements of up to 500 tons per day at the Beaverlodge property. Underground work is to be expanded this year with shaft sinking for dual exploration-development operations a part of the program. Permanent warehouses and housing facilities are being constructed.

ALASKA—The property on Slate Creek where Ogriz and Uotiala were placer mining has been closed and Mr. Ogriz is now operating a dredge with Mr. Stien on Otter Creek near Flat. The *Riley Investment Company* dredged in the area last season. At Chicken Creek the *Awe Mining Company* has been dissolved and the equipment disposed of.

ONTARIO—*Tungsten Corporation of Canada, Ltd.* has transferred the operation and financing of uranium exploration on the property of *Centre Lake Uranium Mines, Ltd.* to a subsidiary, *Ventures, Ltd.* Previously, Tungsten Corp. had directed operations, and had provided 50 percent of the finances for Centre Lake operation. Centre Lake has signed an agreement with *Charlebois Lake Uranium Ltd.* for finances and direction.

YUKON TERRITORY—*Yukon Placer Mining Company* reports that its dredge is operating on the Sixty Mile River, and some open cut work is also being done. The latter has been slowed down because of the low water supply available this year. The company is also working at two other locations—Kirkman Creek and Balleret Creek about 100 miles up-river from Dawson.

ONTARIO—*Preston East Dome Mines Limited* has staked 34 claims lying east of property recently prospected and now held by *Peach Uranium & Metal Mining Company Ltd.*, and Preston has also staked 18 claims to the west. Preliminary reconnaisance has indicated the presence of radioactivity on the easterly group of claims. *Technical Mine Consultants, Ltd.* is now carrying on general prospecting to the north on a 50-50 basis, with expenses equally shared.

SASKATCHEWAN—The recently incorporated *Montario Exploration Ltd.*

SPECIFY

FLEXIPIPE® the quality ventilating tubing

Flexipipe is now available with Rope Seam Suspension *at no additional cost.* The newest, best, quickest suspension . . . eliminates special accessories and suspension wires . . . *all you need is a nail.* It equalizes strain on the tubing.

Flexipipe is efficient, serviceable, economical. Jute and heavy-duty grades available in a variety of lengths and diameters to meet your requirements.

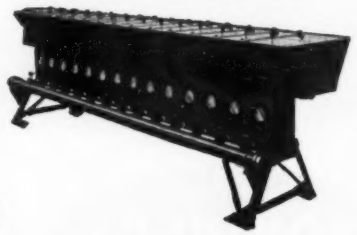
Write for complete information and sample.

Bemis Bro. Bag Co.

111 No. 4th St., Box 23,

St. Louis 2, Mo.

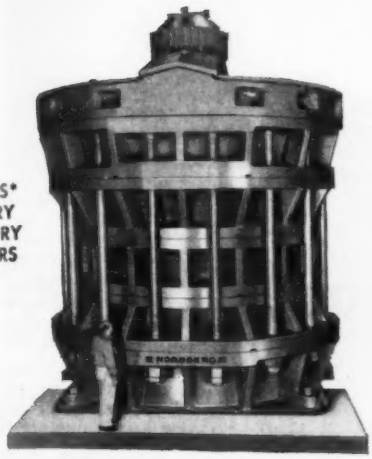
Multiple Sizes Produced Simultaneously



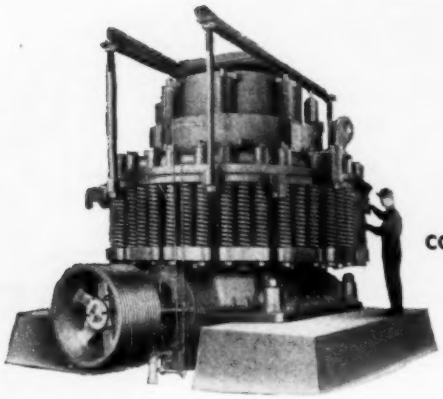
When a number of sharply separated sizes are required, the Concenco Constriction Plate Hydraulic Classifier operates continuously and is fast and accurate. It is made with 1 to 10 or more cells, and delivers as many spigot products as there are cells. Hydraulic water is easily regulated in each cell and there are no moving parts. Send for full information.

THE DEISTER CONCENTRATOR COMPANY

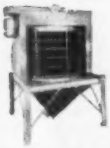
925 Glasgow Avenue Fort Wayne, Indiana



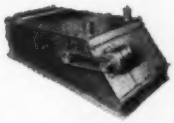
SYMONS* PRIMARY GYRATORY CRUSHERS



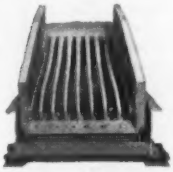
SYMONS* CONE CRUSHERS



SYMONS "V" SCREENS for extremely fine separation



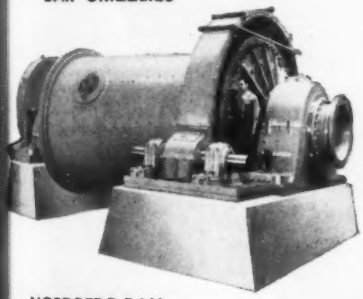
SYMONS* VIBRATING SCREENS



SYMONS* VIBRATING BAR GRIZZLIES

SYMONS* VIBRATING ROD GRIZZLIES

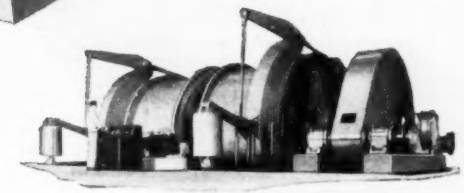
NORDBERG
MINING MACHINERY
... the leading choice of producers THE WORLD OVER



NORDBERG BALL— TUBE and ROD MILLS for wet and dry grinding

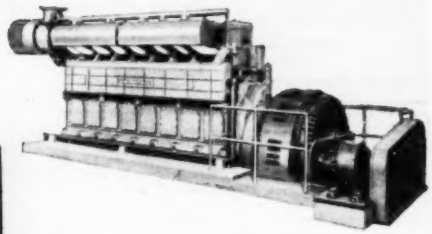
It is highly significant that wherever ores are found in quantity — efficiency-minded producers are now using, or are in the process of installing, Nordberg Mining Machinery . . . to assure maximum and continuous production at low operating and maintenance costs.

Write for literature on the machinery you need.



NORDBERG MINE HOISTS

NORDBERG DIESEL— DUAFUEL® and SPARK-FIRED GAS ENGINES from 10 to over 10,000 H.P. in a single engine.



M153 **NORDBERG MFG. CO., Milwaukee, Wisconsin**

NORDBERG MACHINERY **NORDBERG** CRUSHERS SYMONS SCREENS NORDBERG

MACHINERY FOR PROCESSING ORES and INDUSTRIAL MINERALS

NEW YORK • SAN FRANCISCO • DULUTH • WASHINGTON • TORONTO
MEXICO, D.F. • LONDON • PARIS • JOHANNESBURG

*SYMONS . . . A REGISTERED NORDBERG TRADEMARK KNOWN THROUGHOUT THE WORLD

arranging for exploration of its 13-claim uranium prospect in the Beaverlodge area. The company also holds an option on an additional 27 claims in that area. No plans have yet been announced for the 12-claim gold prospect in the Kirkland Lake area of northern Ontario which the company has.

BRITISH COLUMBIA — *Cody-Reco Mines Ltd.* is stockpiling ore at its lead-zinc-silver property in the Slocan district near Sandon. The 23-claim property consists of several former producers, including the *Noble Five, Surprise, American Boy, Last Chance,* and *Sovereign* properties. A test run at the mill reportedly indicates that it can handle 175 to 200 tons a day.

ALASKA—Development work by the U. S. Bureau of Mines on the *Copper Bullion* claims at Rua Cove on Knight Island in Prince William Sound are described in a new report issued by the Bureau. The investigation was part of the Bureau's program for developing critical and strategic minerals in Alaska. This paticular deposit was selected for additional development because of its nearness and similarity to the old Beatson mine on Latouche Island and the substantial quantity of low-grade ore already developed. The report (No. 4986) gives the analyses of composite samples from a massive sulfide zone considered as a possible source of sulfur.

WORLDWIDE PROFESSIONAL DIRECTORY

AGENCE MINIERE & MARITIME S. A.
2 rue Van Eree, Antwerp, Belgium
Sworn weighers, samplers, assayers of ores, metals. Agents for shippers to European ports, plants. Market surveyors, commercial advisers, assuring sales direct to consumers

HERBERT BANKS JOHNSON
CONSULTANT
Electrostatic Separation
Process Developments
520 East Ave. Rochester 7, N. Y.

LUNDBERG EXPLORATIONS LIMITED
Consulting Geologists & Geophysicists
Specialty Airborne Electromagnetic, Radioactive & Magnetic Surveys.
VICTORY BUILDING, TORONTO

DOLORES EXPLORATION CO.
will set up and operate
URANIUM
- Exploration projects
- Surface and subsurface geology
- Aerogeological prospecting
- Drilling programs, Ore reserves
- A.E.C. experience
- Estimates upon request

Box 973, Beverly Hills, Calif.

JOHN F. MEISSNER ENGINEERS, INC.
Consulting Engineers
Conveyor Systems — Storage Methods
Crushing Plants — Ship Loading Docks
Materials Handling and Processing Plants
308 W. Washington St. Chicago 6, Ill.

MARVIN J. UDY
Inorganic Chemistry — Electrochemistry
Electric Furnace Smelting
Process Metallurgy
Ferro-Alloys, Calcium Carbide, Phosphorus
546 Portage Road Telephone 2-6794
NIAGARA FALLS, N. Y

HARRY J. WOLF
Mining and Consulting Engineer
Examinations—Valuations—Management
420 Madison Ave., New York 17, N. Y.
Cable: MINEWOLF Tel.: Plaza 9-1700

AUSTRIA—The *Bleiberger Bergwerks Union* (Bleiberg Mining Union) plans to build a 9,000-ton zinc plant by the middle of 1954. The plant will use zinc ores produced by the company in the north Tyrolean area.

NORWAY—A Swedish mining concern, *Boliden A/B,* has requested a long-term mining concession permitting copper exploration in the northeast part of Norway where the firm has found sufficient indications of sulphur-copper-gold deposits. The company has suggested to the Norwegian government that a company be set up, partly financed by Swedish funds, to operate the mines and processing plant, with final smelting to be done in Sweden. The specific area involved covers about 900 square miles in the vicinity of Kautokeino, Finnmark.

PORTUGAL—A jigging plant may be installed by *Mines et Industries* at Louzal to beneficiate pyrite. Current production of 800 tons daily is hand picked to meet the sulphur needs for sulphuric acid production. The grade has now dropped and the dissemination of the pyrite has become so fine that the old method is no longer considered adequate.

POLAND—Iron ore production which was around 680,000 tons during 1949 is to be increased to 3,000,000 tons in 1955, the last year of the current Six-Year Plan.

BELGIUM—*La Societe de la Vieille-Montagne* reports that its mines and smelters produced 126,575 metric tons of zinc ore and 32,749 tons of slab zinc during 1952. Among its other production items were 11,608 tons of zinc oxide, 27,206 tons of soft lead, 32,499 kilograms of silver, 443 tons of cadmium, 194,051 tons of sulphuric acid, and 5,031 tons of copper sulphate. The Societe is a combined group of French and Belgian concerns. Belgium, the second largest exporter of zinc metal and the third largest refiner, showed a decrease in production from 198,100 metric tons in 1951 to 185,500 tons in 1952.

AUSTRIA—The government has decided to revise the 1854 mining law, and has submitted a draft to the parliament. The law's original 270 paragraphs were often amended during the last 99 years and about two-thirds of them abolished, so that it only loosely governed the mining industry. The new law would distinguish between the "federal" or monopoly mineral—salt—the land owners' minerals—clay, magnesite, and kaolin—and the rest of the minerals which need concessions prior to mining.

SWEDEN—A large pelletizing plant is being constructed by *Loussavaara-Kiirunavaara A/B (Bolaget)* at Malmberget mine. Two vertical 6- by 10-foot furnaces will be built. The ore mined at Malmberget is a plus 60 percent magnetite which is beneficiated to reduce phosphorus content. A 71 percent iron concentrate results.

FRANCE—Three French steel firms have decided to merge, provided stockholders agree, and will form a new company called *Lorraine-Escaut.* The firms involved are *Acieries de Longwy, Societe Metallurgique de Senelle-Maubeuge,* and *S.A. Escaut et Meuse.*

HUNGARY—The Ministry of Mines will attempt to speed up the production of bentonite, the country's second most important mineral next to bauxite.

POLAND—A 1953 trade agreement with the Soviet Union will provide Poland with iron, manganese, and chromium ore in exchange for Polish zinc.

AUSTRIA—A new electrolytic copper plant has been opened in the Tyrol district at Brixleck. The plant's new divisions will permit an annual output of 8,000 metric tons of copper, while the old divisions constructed during the war will yield 4,000 tons after modernization. A total of 12,000 metric tons will be produced, or 10 percent more than the present domestic requirements. The *Mitterberger* copper mines are the main suppliers of concentrate for the mill.

ALBANIA—Albania will receive mining machinery from the Soviet Union in exchange for copper. During the first quarter of 1953, the mining industry fulfilled only 85.6 percent of its production goal.

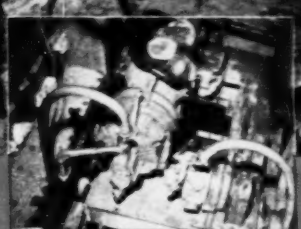
FRANCE—A wolframite deposit averaging 1.5 percent WO_3 is being prospected and developed by *Mines Salsigne.* Metallurgical test work has indicated that the ore is amenable to gravity separation and a jigging plant may be built. Meanwhile, some ore is being run through the gold mill.

GREECE—Test work is being conducted at the *Kozani Mines* of the *Hellenic Company of Chemicals and Fertilizers* in Macedonia. Chromite minerals which occur in serpentine appear to be freed after grinding to minus-65-mesh; however, it is believed that by grinding to only minus-40-mesh, a fair recovery of a concentrate assaying 48 percent Cr_2O_3 can be made. A 100-ton mill consisting of ball mill, classifier, and Humphreys spirals may be installed.

FRANCE—A costly mechanization program is resurrecting the war-devastated iron mines of France. The annual output of iron ore from the *Lorraine* mines was laboriously increased to 32,800,000 tons in 1951, but by 1958 the same mines will be producing 53,000,000 tons a year. An initial investment of $20,000,000 went into the mechanization program in 1949 with another $53,000,000 invested in 1949. Current plans call for expenditure of another $143,000,000 more in the next five years for plant improvements and new equipment. A great part of the money and equipment was made available through the Marshall Plan.

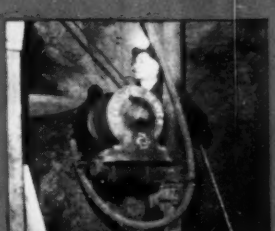
NORWAY—Under a trade arrangement with the Soviet Union, Norway will export 15,000 tons of hardened fats, 25,000 tons of salted herrings, and 3,000 tons of aluminum to the Soviet Union. In return, Norway will receive 30,000 tons of manganese ore, 20,000 tons of raw phosphate, 35,000 tons of wheat, and 30,000 tons of rye.

SPEED and POWER under FINGER-TIP CONTROL with GARDNER-DENVER AIRSLUSHERS

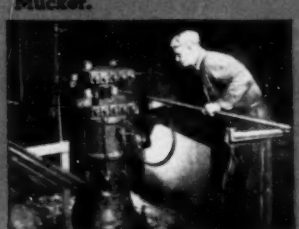


Speed shaft sinking with the Double Drum HM8 Shaft Mucker.

other GARDNER-DENVER ways to reduce mining costs:



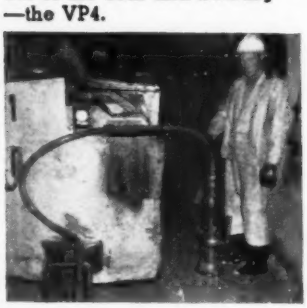
Put tugging power where you want it, with compact Air Hoists.



Shape drill steel on the fast-acting DS6 Sharpener.

Protect rock drills with the L012 Automatic Line Oiler.

Handle water with the pneumatic pump that keeps grit out of the seal and bearing —the VP4.



Write for Bulletins describing Gardner-Denver Mining Equipment.

GARDNER-DENVER SINCE 1859

Export Division: 233 Broadway, New York 7, N. Y., U.S.A.
Gardner-Denver Company, Quincy, Illinois, U.S.A.

THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS

with a SAUERMAN SCRAPER

Here is a typical Sauerman Scraper set-up operating in one of the world's largest aluminum plants, located in Quebec, Canada. Altogether, nine such scrapers are utilized in a series of specially designed buildings to provide efficient, economical indoor storage of pitch, coke, and bauxite. Length of span varies from 700 to 1900 ft.

Sauerman Scraper systems provide low-cost handling of bulk materials . . . from ashes to heavy ore . . . indoors or outdoors . . . at plants, large or small. The Crescent Scraper's bottomless design provides fast loading to capacity and clean, automatic discharge.

Send now for this useful 32-page Bulk Storage Catalog

SAUERMAN BROS. Inc.

538 S. Clinton St., Chicago 7, Ill.

MORE FOOTAGE FOR YOUR DOLLAR

with Ascolite • Nicolite • Bronzolite Diamond Drill Bits

ANTON Smit & Co., Inc.

Importers & Dealers—Carbons, Bortz, Ballas

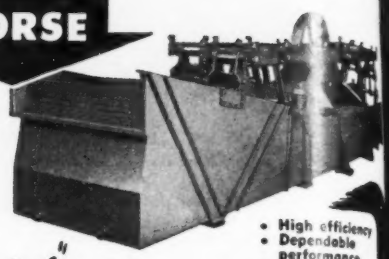
Manufacturers of Diamond Tools

333 West 52nd St., New York 19, N. Y.

Cables: PROFITABLE, New York

Send for Catalogs

MORSE



"Trueline"

- High efficiency
- Dependable performance
- Trueline stroke
- Large capacity

RAKE CLASSIFIERS

DEPENDABLE CLASSIFIERS THAT IMPROVE PERFORMANCE, SIMPLIFY OPERATION AND LOWER MAINTENANCE.

Large and quiescent pool areas give high overflow efficiency. Long "Trueline" strokes, parallel to the tank bottom, discharge the maximum quantity of sands. Fabricated steel construction gives extra strength and long service.

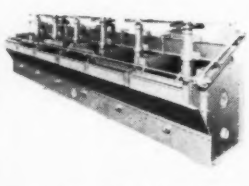
COMPACT DRIVE
SMOOTH OPERATION
METALLURGICALLY RIGHT

WRITE FOR BULLETIN

MORSE BROS. MACHINERY COMPANY

ESTABLISHED 1898

DENVER, COLORADO, U. S. A. (CABLE MORSE)



DENVER "SUB-A" FLOTATION

• The old reliable Standard Flotation Machine with new modern improvements making it Standard, Reliable and Efficient.

Deliveries from stock on most sizes.

DENVER EQUIPMENT CO.

1400 Seventeenth St. Denver 17, Colorado

CHANGE OF ADDRESS

CIRCULATION DEPARTMENT
WORLD MINING,
121 Second St., San Francisco 5, Calif., U. S A

Please change the address of my World Mining copy

Name .....

Old Address .....

New Title or Position .....

New Address .....

.....

(please print)

New Company Connection .....

ENGINEERING BOOKS:

Views and Reviews

ANUAL OF ROCK BLASTING. By a special editorial board with Dr. K. H. Fraenkel, Royal Power Board, Stockholm, Sweden, editor-in-chief. Published by Aktiebolaget Atlas Diesel, Stockholm, Sweden, and Sandvikens Jernverks Aktiebolag, Sanviken, Sweden. Loose-leaf, plastic-covered binder so that subsequent articles can be filed in correct chapter. The book will be sold at the price of $15.00 U. S. dollars or in foreign countries at the local equivalent. Orders can be placed with the nearest representative of Atlas Diesel or ordered directly from A B Atlas Diesel, Stockholm, Sweden. Branch offices include: Copco Pacific, Ltd., 930 Brittan Avenue, San Carlos, California; Copco Eastern, Ltd., 151 Linwood Avenue, Patterson, New Jersey; and Canadian Copco, Ltd., A. M. F. Montreal, Quebec, Canada.

This is a standard international handbook printed in English, Swedish, French, and German. It is the first scientific publication dealing with the technical and practical aspects of rock blasting in mining, tunneling, and excavating. Numerous charts, diagrams, performance record sheets, photographs, and tables add much to the value of the book.

Eight chapters deal with Rock Blasting Methods, Planning and Practical Results, Compressed Air Supply, Drill Steels, Explosives, Ventilation, Terminology, and Geology. The Rock Blasting section is particularly complete with a discussion of factors affecting blasting results, types of cuts, practical examples of drilling cycle studies, and a new testing method to determine the drillability of rock.

No mine study official or engineering department can afford not to have this book. Its use can mean lower rock breakage costs.

TREATISE ON ORES AND ASSAYING. By Lazarus Ercker, 1574. Translated by Anneliese Sisco and Cyril Stanley Smith. University of Chicago Press, Chicago, Illinois, 1952. 360 pp., 41 figures are reproductions of the woodcuts used in the 1580 Germany edition. $10.00

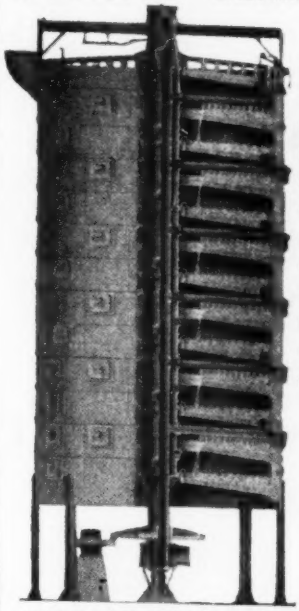
This is the only modern translation of an important historical text on metallurgy and analytical chemistry which was first published as *Beschreibung allerfurnehisten mineralischen Ertzt und Berghwercksarten.* Ercker, superintendent of mines for the Holy Roman Emperor Rudolph II, wrote in the days before the birth of modern science. It was the assayer—far more than the alchemist—who laid the foundation for quantitative chemistry; and, of all the early assayers, it was Ercker who best recorded their methods. He emphasized the quantitative aspects of metallurgical reactions and was completely free of mysticism and alchemy hocus-pocus.

Although the book is not principally concerned with full-scale metallurgical operations, it contains excellent chapters on the washing and amalgamation of gold ores and the smelting of copper, tin, and lead; and it provides much information on iron, mercury, antimony, and other metals.

Copies of any of these books may be purchased from *Mining World,* 121 Second Street, San Francisco.

PACIFIC FURNACE

MULTIPLE HEARTH FURNACE

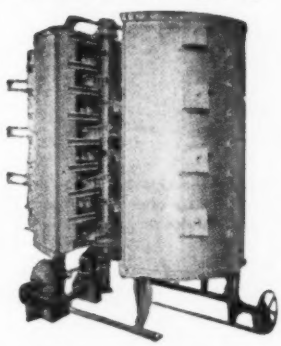


SIZES 8′ 6″ TO 22′ 3″ DIAMETER
NUMBER OF HEARTHS, 1-16

ROASTING
CALCINING
DRYING

ZINC ORES	QUICKSILVER
IRON ORES	MAGNESITE
COPPER ORES	LIMESTONE
TIN ORES	MOLYBDENUM
NICKEL ORES	BONE CHAR
LEAD ORES	DIATOMITE
SODA ASHES	LIME SLUDGE
FULLERS EARTH	MAGNESIUM
CARBON	CLAY GRANULES
PYRITE	ANTIMONY

SELENIUM
SEWAGE SLUDGE
LEAD CHEMICALS
METALLIC SLUDGES
FILTERING MEDIA
And for Numerous Other Materials



Pacific Laboratory Furnace

PACIFIC LABORATORY FURNACE

Manufactured in two sizes—36″ and 54″ inside diameters having 6-8-10 Hearths and include the same features as the commercial size furnace.

Pacific Furnacing Unit

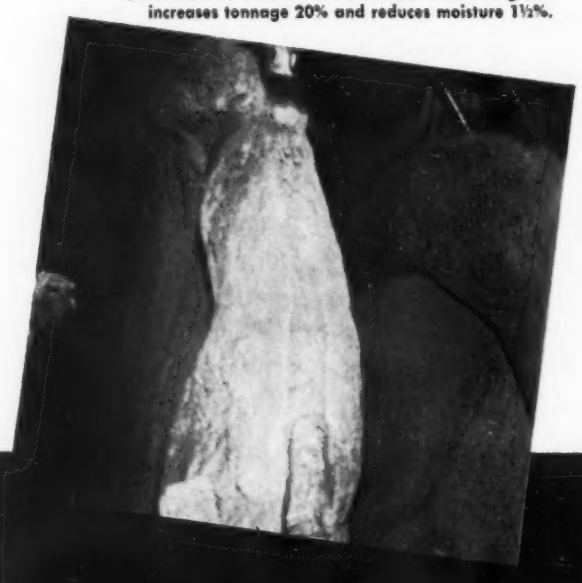
NEW
PACIFIC FURNACING UNIT

Higher shell height. Three gas burners. Provision for conversion to muffle unit. Small volume roasts at any desired temperature.

PACIFIC FOUNDRY COMPANY LTD.
Engineers and Metallurgists

1400 So. Alameda St. Los Angeles
3100 19th St. San Francisco
551 Fifth Ave. New York

Above: Agidisc filtering copper concentrate. Below: Standard disc on same feed as filter above. Agidisc increases tonnage 20% and reduces moisture 1½%.



The Eimco Agidisc Filter for Continuous Vacuum Filtration of Metallurgical Slurries

These photographs show some of the important exclusive features offered in the Eimco Agidisc. Smooth, even, uniform cake formation in the two upper pictures which contrast with the typical standard disc filter with the heavy, lumpy build up of cake in the outside ring of the disc. (shown lower left.) The Agidisc with its uniformity of cake deposit, will make possible in your filtering station, higher capacity, lower moisture and longer bag life.

Our pilot plant will gladly run tests on your material and recommend size and type of filter to give you the best results. Write for information.

An Eimco Ag

EIMCO AH27

THE EIMCO CORPORATION

The World's Leading Manufacturer of Vacuum Filtration Equipment

EXECUTIVE OFFICES AND FACTORIES - SALT LAKE CITY 10, UTAH, U. S. A.

BRANCH SALES AND SERVICE OFFICES:

NEW YORK, 51-52 SOUTH STREET • CHICAGO, 3319 SOUTH WALLACE STREET
BIRMINGHAM, ALA., 3140 FAYETTE AVE • DULUTH, MINN., 216 E. SUPERIOR ST.
EL PASO, TEXAS, MILLS BUILDING • BERKELEY, CALIF., 637 CEDAR STREET
KELLOGG, IDAHO, 107 DIVISION ST. • LONDON W. 1, ENGLAND, 190 PICCADILLY

IN FRANCE, SOCIETE EIMCO, PARIS, FRANCE
IN ENGLAND, EIMCO (GREAT BRITAIN) LTD., LEEDS 12, ENGLAND
IN ITALY, EIMCO ITALIA, S.P.A., MILAN, ITALY

U.S.A. Metal & Mineral Prices

METALS

August 19, 1953

PER:	**Electrolytic.** Delivered F.o.b. cars, Valley basis	28.50-30.00¢
	Lake. Delivered, destination U.S.A.	30.125¢
	Foreign Copper. Valley basis	28.50-30.00¢
D:	**Common Grade.** New York	14.00¢
	Tri-State Concentrates, jig, flotation 80% lead, per ton	$173.70
C:	**Prime Western;** F.o.b., E. St. Louis	11.00¢
	Prime Western; Delivered in USA	11.25*-11.50**
	(*Delivery east of Rocky Mountains. **To any destination in the USA).	
	Tri-State Concentrate, 60% zinc, per ton	$65.00
MINUM:	**Primary 30 Pound Ingots (90%) plus).** F.o.b. shipping points	21.50¢
TIMONY:	**Lone Star Brand.** F.o.b. Laredo, in bulk	35.00¢
RUTH:	(in ton lots) price per pound	$2.25
MIUM:	**Sticks and bars.** 1 to 5 ton lots (Price per pound)	$2.00
ALT:	**97-99%,** keg of 550 pounds (Price per pound)	$2.40
GNESIUM:	**Ingots (99.8%).** F.o.b. Freeport, Texas	27.00¢
CURY:	**Flasks.** Small lots, New York	$191.00-$193.00
KEL:	**"F" Ingots (5 pounds).** F.o.b. refinery, Port Colburne, Ontario	60.00¢
	Grade A Brands. New York (Price per pound)	79.25¢
ANIUM:	**99.3%** + (Price per pound)	$5.00
D:	United States Treasury price	$35.00 per ounce
ER:	**Newly mined domestic.** United States Treasury price	90½¢ per ounce
	Foreign Handy & Harman	85.25¢ per ounce
TINUM:		$93.00 per ounce
CONIUM:	**Powder,** 100 pound lots, per pound	$7.00

ORES AND CONCENTRATES

RYLLIUM ORE:	**10 to 12% BeO.** F.o.b. mine, Colorado	$45.00 per unit
	Small lot purchases at Custer, S. D., Spruce Pine, N. C., and Franklin, N. H. Visual inspection at $400.00 per short ton or by assaying at: 8.0 to 8.9% BeO, $40 per unit; 9.0 to 9.9%, $45; over 10.0%, $50.	
CHROME ORE:	F.o.b. railroad cars eastern seaports. Long tons dry weight.	
	African (Rhodesian). 48% Cr_2O_3. 3 to 1 Ratio	$44.00-$46.00
	African (Transvaal). 48% Cr_2O_3. No Ratio	$34.00-$35.00
	Turkish. 48% Cr_2O_3. 3 to 1 chrome-iron ratio	$54.00-$56.00
	U. S. Government ore purchase depot Grants Pass, Oregon, Base price, lumpy ore, $115.00; fines and concentrates $110.00 for 48% Cr_2O_3 and a 3 to 1 chromium-iron ratio. Premiums for higher grade ore and for a ratio up to 3.5 to 1. Penalties for grades down to 42% Cr_2O_3.	
COLUMBIUM-TANTALUM ORE:	At United States small lot beryl purchase depots. $3.40 per pound contained combined pentoxides in 50% ore.	
RON ORE:	Lake Superior. Per gross ton Lower Lake Ports.	
	Mesabi, Non Bessemer, 51.5% Fe. Second quarter	$9.90
	Mesabi, Bessemer, 51.5% Fe. Second quarter	$10.05
	Old Range Non Bessemer. Second quarter	$10.15
	Old Range Bessemer. Second quarter	$10.30
	Swedish, Atlantic Ports, 60 to 68% Fe, Contracts, Per Unit	20.00¢
MANGANESE ORE:	**Metallurgical grade.** 46 to 48% Mn. Long ton unit	$1.15-$1.17
	Chemical grade. 80% MnO_2. Per ton	$70.00
	Domestic U. S. Government ore purchasing depots: Deming, New Mexico; base price $2.30 per long dry ton unit of recoverable manganese less handling and treatment costs. Wenden, Arizona; base price of $8.54 per long dry ton of 15% manganese ore. Butte, Montana; (black and pink ores) base price of $4.87 per long dry ton of 18% manganese ore. Phillipsburg, Montana base price of $6.43 per long dry ton unit of 15% manganese ore. Small lot program f.o.b. railroad cars, minimum 40% Mn. Base price (48%) $2.30 per unit with premiums and penalties.	
MOLYBDENUM CONCENTRATE:	90% MoS_2. F.o.b. Climax, Colorado. Per pound of contained molybdenum, plus cost of containers	$1.00
TUNGSTEN CONCENTRATE:	**Domestic.** 60% WO_3 Per short ton unit	$65.00
	Foreign. 65% WO_3 Per short ton unit	$50.00
URANIUM ORE:	**Carnotite-Roscoelite.** F.o.b. purchase depot plus $0.06 per ton mile ($6.00 maximum), Grand Junction, Rifle, Durango, Naturita, and Uravan, Colorado. Salt Lake City, Marysvale, Thompsons, and Monticello, Utah. Shiprock, New Mexico, Edgemont, S. Dakota. Base price for 0.10% ore is $1.50 per pound and up to $3.50 per pound of contained U_3O_8 plus $0.75 per pound for each pound in excess of 4 pounds per short dry ton and an extra allowance of $0.25 per pound for each in excess of 10 pounds. A $0.50 per pound development allowance paid on all ores purchases. At Shiprock all ores with more than 6% lime are penalized for excess lime.	
VANADIUM ORE:	**Carnotite-Roscoelite.** V_2O_5 in ratio of more than 10 parts to 1 part of U_3O_8 are generally acceptable at all AEC depots, but excess not paid for at Marysvale, Monticello and Shiprock. Per Pound V_2O_5, $0.31	

NON-METALLIC MINERALS

NTONITE:	**Minus-200-mesh.** F.o.b Wyoming points. Per ton in carload lots	$12.50
	Oil Well grade. Packed in 100 pound paper bags	$14.00
ORSPAR:	**Metallurgical grade.** 70% effective CaF_2 content per short ton F.o.b. Illinois-Kentucky mines	$42.50
	Mexican. 70% f.o.b. border	$30.00
	Acid Grade. 97% CaF_2 f.o.b. Kentucky, Illinois, Colorado	$60.00
LITE:	**Crude:** F.o.b. mine per short ton	$3.00 to $5.00
LPHUR:	**Plaster grades.** Crushed and sized. F.o.b. plants	$7.00 to $9.00
	Long ton, F.o.b. Hoskins Mound, Texas	$25.50
	Export	$30.50

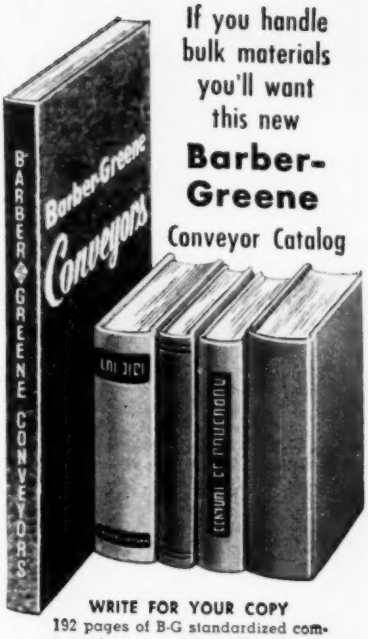
LONDON METAL AND MINERAL PRICES

August 13, 1953

			Per Long Ton	USA Equivalent cents per pound[1]
PPER:	**Electrolytic, spot**	£230	0s 0d	28.75¢
AD:	**Refined, 99.97%**	£95	15s 0d	11.97¢
NC:	**Virgin, 98%**	£74	0s 0d	9.25¢
UMINUM:	**Ingot, 99.5%**	£150	0s 0d	18.75¢
TIMONY:	**Regulus, 99.6%**	£237	10s 0d	29.69¢
N:	**Standard, 99.75%**	£595	0s 0d	74.37¢
NGSTEN:	**Long ton unit, 30Ss, equivalent to**			$42.70

1. With Sterling pound at $2.80.

Quotations on metals and certain ores through the courtesy of *American Metal Market*, New York, N.Y.



If you handle bulk materials you'll want this new

Barber-Greene

Conveyor Catalog

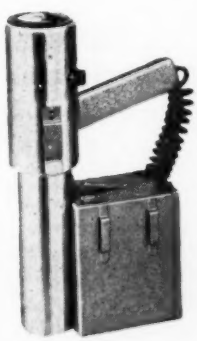
WRITE FOR YOUR COPY

192 pages of B-G standardized components, accessories, typical conveyor layouts and installation photographs. Complete, comprehensive, easy-to-use. Please request catalog 76-A on your company letterhead.

Barber-Greene
AURORA, ILLINOIS, U. S. A.

SCINTILLATION COUNTERS

FIND URANIUM 100 TIMES EASIER



MODEL 111 (pictured above) . . . $495.00
FAMOUS HALROSS MODEL 939 . . 975.00
AIRBORNE OPTIMUM MODEL SAB-7 . 2810.00

• • • • •

ALL TYPES GIEGER COUNTERS
ULTRA VIOLET LIGHTS
SPECIAL LONG PROBE SCINTILLATION AND GIEGER COUNTERS FOR DRILL HOLES

• • • • •

ENGINEERS SYNDICATE, LTD.
5011 Hollywood Boulevard
Hollywood 27, California
OLympia 2167

PRODUCTION EQUIPMENT PREVIEW

PEP is just what new equipment, increased mechanization, and new methods can give to your mine, mill, or smelter. This PEP section is MINING WORLD'S way of making available to you some of the finest current information on mechanization.

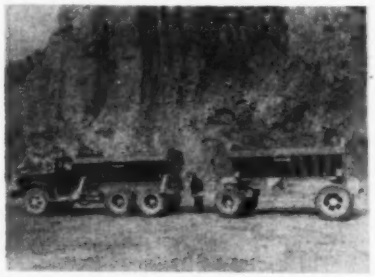
Shuttle Car Designed For Smaller Workings

Of interest to many mine operators is this 4-wheel steering, 4-wheel drive, 4,000-pound capacity shuttle car, manufactured by Getman Brothers of South Haven, Michigan. The shuttle car illustrated is working very satisfactorily in a mine having tunnels 8-feet square with some additional clearance at intersections and loading points.

The car is equipped with an HD-260 Continental engine having a heavy-duty oil bath air cleaner and a 35-ampere generator. The transmission provides 4 speeds forward and 4 speeds reverse from one to twenty miles per hour. The hydraulically operated dump box has a capacity of 1.75 cubic yards or two tons and is available in a variety of dimensions as necessary to adjust to specific conditions. Additional information may be obtained by circling No. 79.

Side-Dump Combinations Attract Wide Interest

Tractor-and-double-trailer or truck-and-trailer combinations are a logical development of the Easton side-dump idea. Combinations of both types have attracted wide interest for use on new installations as well as for conversion of equipment already in use.

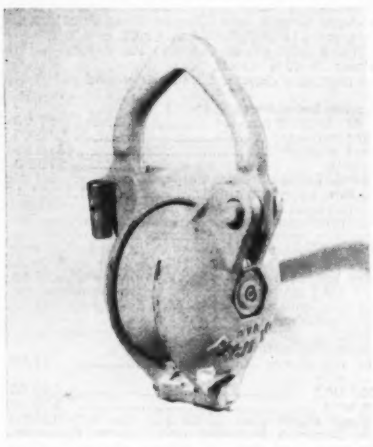


Easton side-dump trailers and truck bodies are available in several capacities in lift-door, drop-door and pan-type designs. Drop-door units employ integral hydraulic hoists and may be dumped anywhere.

One advantage of Easton side-dump equipment is the opportunity for separate maintenance on either unit of the combination. With the remaining unit held in service, the amount of production lost through down time is sharply reduced. Also, when seasonal weather conditions such as mud, ice and snow demand greater tractive effort, the combinations may be separated. Circle no. 73.

New Wide Throat Block Stops Rope Fouling

A new Pacific 6" wide throat carrying block now being manufactured by Alloy



Steel & Metals Company is offered with either hook or shackle suspension. The wide throat of the shackle suspended model will pass a 1¾" square knot.

The block has solid side frames and its spacer is an integral part of the side frames. Sheave is recessed into side frames to prevent rope fouling. Roller bearings are grease-sealed to prevent entrance of foreign matter. It is made of heat-treated alloy steel with extra heavy construction of sheave for long wear.

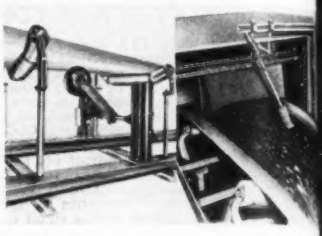
Circle No. 56.

New Booklet Published By Industrial Diamond Assn.

New publication of the Industrial Diamond Association of America, Inc., is entitled "The Diamond That Pays For Itself." It points out the applications of industrial diamonds in all segments of industry. Copies of the 16-page, illustrated booklet are available to readers of this magazine. Circle No. 55.

Belt Conveyor Controls Regulate Production Units

Two devices for use on conveyors and chutes have been made available to the general industry by the Johnson-March Corporation to control related operations in the handling or processing of materials. These controls are adaptable to any materials handling system for activating signal lights, auxiliary conveyors or other controls.

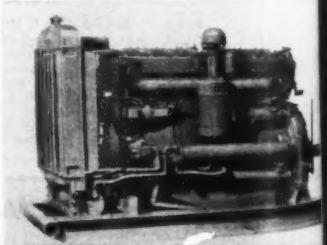


One device known as the Model T automatic conveyor control is designed for operation and installation under belt conveying coarse, abrasive, or lumpy material. The control is mounted beneath the belt on a spring loaded shaft which exerts light tension on the shaft arm and the master wheel rolling against the belt.

The other control device, the Model 4A automatic conveyor control, is installed over conveyor belts handling light weight materials which would not deflect the belt. This type of control can also be used on chutes, pan, and vibrating conveyors. For further details, circle no. 61.

Diesels Offered In Wide-Range Line

The power range of Murphy Diesel engines has been extended upward with the addition of four new models having a bore of 6⅜ inches and a stroke of 7 inches. Ratings of the new models range



from 185 hp continuous, 200 hp. intermittent; to 225 hp. continuous, 240 hp. intermittent.

The addition of these four models brings to 25 the number offered by Murphy Diesel. They range in output from 90 to 240 hp. Further information on the new models can be obtained by circling No. 78.

MINERAL DRESSING NOTES: American Cyanamid's latest publication in their Mineral Dressing Notes series is a 32-page bulletin entitled "Heavy-Media Separation Processes for Mineral Concentration." The booklet contains descriptions of plants treating a variety of metallic and non-metallic ores, a list of operating and planned plants, and a complete bibliography of Heavy-Media Separation. Circle no. 1.

AUTOMATIC ROCK DRILL: A new automatic drilling machine, featuring an integral air-leg feed and automatic air-water back-head, is in production by the Thor Power Tool Company. This one-man unit is equipped with a specially designed 45-pound sinker rock drill and a 2¼-inch diameter feed leg, available in either 36- or 48-inch lengths. To obtain the full details and specifications contained in Thor's bulletin JE 1640, circle no. 2.

EUCLID PARTS BOOKLET: The parts department of the Euclid Road Machinery Company has just published an illustrated 24-page booklet that will be of special interest to users of Euclid equipment. Circle no. 3.

REDESIGNED TANDEM SLUSHER: Vulcan-Denver has modified their 150-hp. tandem slusher design to meet the most extreme operating and maintenance requirements. Drum and clutch wearing surfaces are quickly replaced without completely dismantling the assemblies, and long-wear manganese steel shoes replace rope rollers under the theory that with slusher rope ordinary wear is not the major problem. For complete information, circle no. 4.

COMPLETE FEEDER CATALOG: A 12-page catalog has been released by the Hardinge Company that describes in detail feeders of all types: constant-weight feeders, weight-measuring feeders, volumetric belt feeders, disc feeders, and volumetric non-flooding drum feeders. Circle no. 5.

LATEST IN CYCLONE THICKENING: Heyl & Patterson has a new bulletin describing the company's latest developments in cyclone thickening and the "jet-injection" cyclones that are now available. Recovery curves and operating test cases are included to point out the performance efficiency of the new machines. Circle no. 6.

CLASSIFIER BULLETIN: Western Machinery Company offers a bulletin on classifiers that provides complete information on the design features and performance characteristics of Wemco S-H units. Operating notes and calculations used in wet classification together with reference tables listing classifier specifications and capacities are included. Circle no. 7.

POWER SHOVELS: A bulletin just published describes the new Marion Power Shovel Company's 111-M Ward-Leonard electric shovel. This excavator carries a standard 4-yard dipper and can be converted to a dragline, clamshell, crane, or coal loader. For your copy of bulletin no. 408 on Marion's 111-M, circle no. 8.

PULL-TYPE SCRAPERS: A new 12-page illustrated catalog has been issued by the Tractor Division of Allis-Chalmers Manufacturing Company covering the line of seven pull-type scrapers now available through A-C dealers. Seven units ranging from 2- to 18-cubic-yard capacity are featured. Circle no. 9.

HALF-YARD, TEN-TON SHOVEL-CRANE: A newly designed crawler mounted excavator rated at ½-ton with either shovel or hoe, or 10-ton when equipped for crane service, is being produced by the Koehring Company. Improvements in the new model include fully enclosed gears, automatic brakes, a new cab design and lever arrangement, adjustable hook rollers, and an electric dipper trip arrangement. Circle no. 10.

D-DRILL CORE AND BIT SELECTOR: The Koebel Diamond Tool Company has made available to diamond drillers a 15 page booklet that describes the many types of bits the company makes. The descriptive information on the uses of each makes the bulletin a handy guide to the proper selection of bits for any purpose. Circle no. 11.

HIGH PRESSURE AIR HOSE: A new high pressure air hose designed for the rugged service inherent in mining has been developed by the Boston Woven Hose and Rubber Company. Capable of withstanding working pressures up to 2,000 pounds per square inch, the hose is more flexible than any other hose of its type. The eight available sizes range from ⅜ to 2½ inches inside diameter. For further details, circle no. 12.

BIT INFO: Four new mining bits are included in the latest supplement, CM-112, to the CM-110 mining catalog issued by the Carboloy Department of General Electric Company. The bits described are: the CC-3 extra heavy duty bit, the WAPT-22 prong-type roof bolt bit adaptable for both wet and dry drilling, and a new AD-36 auger bit with a 2¼-inch diameter and a 13/16-inch hex shank. Circle no. 13.

BIN WEIGHING: Methods of weighing the contents of tanks, bins, and hoppers electronically with Baldwin SR-4 load cells is explained in bulletin 4106 issued by Baldwin-Lima-Hamilton Corporation. Information covered includes design considerations such as mountings, temperature effects, and vibrations; indicating and recording instruments; weighing accuracy; and Baldwin-Lima-Hamilton's engineering services. Circle no. 14.

SPECTROPHOTOMETRY EXPLAINED: "What Every Executive Should Know About Spectrophotometry," a booklet released by Beckman Instruments, Inc., tells in readable "layman's" language what the instrument is, how it works, and what to look for in selecting an instrument for any of its countless applications. Circle no. 15.

PRODUCTS FOR MINING: The hose, conveyor belts, v-belts, and tape made by the Boston Woven Hose & Rubber Company for the mining industry are described in a rotogravure brochure recently published. Proper applications and installations are featured. Circle no. 16.

MANGANESE MILLING: Manganese concentration is described in Flowsheet M7-F24, published by the Denver Equipment Company. It deals with the problem of production of acceptable grades of manganese concentrates at a maximum recovery of the total manganese from ores having variable characteristics. For your copy of this study, circle no. 17.

CRAWLER TRACTOR CONTROL: A four-page folder illustrating and describing the new Baker Power Control Unit

Circle numbers and mail this card for free product literature

to get further information on any item described in the Production Equipment Preview, note the key number of that item, circle the corresponding number on the REP card at the right, and mail. If mailed from a point outside the United States, proper postage must be used.

PLEASE PRINT

This card may also be used to subscribe by filling in here

See other side for subscription rates

SEPTEMBER 1953 — NOT GOOD IF MAILED AFTER NOVEMBER 25

FILL IN NUMBERS OF ITEMS YOU DESIRE

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80

Also send further free information on the equipment advertised on pages

....., Product ..... Manufacturer .....

....., Product ..... Manufacturer .....

Name ..... Title .....

Company .....

Address .....

Use this section to subscribe only

☐ New Subscription

☐ Renewal

☐ 1 yr. $3

☐ 2 yr. $5

Name ..... Title .....

Company .....

Address .....

for use with crawler tractors has been published by the Baker Manufacturing Company. Performance details are given on the new design features of the unit's multiple-disc clutch, simplified brakes, adjustable hand levers, and sheave mountings. Circle no. 18.

500 CONVEYOR IDLERS: More than 500 belt conveyor idlers in 34 types, designed to meet practically every requirement, are pictured and described in a new 48-page book, no. 2416, just released by Link-Belt Company. Detailed information is provided for selection and spacing, based on weight and lump size of material to be conveyed. Schematic drawings and dimensional data are included for each type of idler. Circle no. 20.

MINE FIRE TRUCK: Featured in a new bulletin issued by the Mine Safety Appliances Company is a specially designed unit that includes a sheet steel all-welded water tank of 1000-gallon capacity, a centrifugal pump that delivers 50 gallons of water per minute through 500 feet of 1½-inch hose, and a combination fog and straight-stream nozzle, all mounted on springs and roller bearing wheels. Circle no. 21.

CATALOG ON PACKINGS AND GASKETS: A comprehensive catalog on the proper installation and care of packings has been published by the mechanical goods division of the United States Rubber Company. Installation information, engineering tables, conversion charts, and maintenance material are included. The 112-page book is equipped with a four-page index. Circle no. 22.

PORTABLE pH METERS: The four portable pH meters that constitute the series manufactured by Beckman Instruments, Inc. are fully treated in a recent release by the company. From research to field work, all necessary applications can be covered by the four meters. For your copy of bulletin 322-54, circle no. 23.

DIAMOND DRILL BITS: A well illustrated 16-page file folder, tab indexed for the users convenience, has just been published by Anton Smit and Company, manufacturers of diamond drilling products. This catalog contains the very latest information concerning developments in diamond drill bits, a valuable adjunct to the mining engineer's library. Circle no.24.

COPPER MILLING: Bulletin M4-B67, published by Denver Equipment Company, describes every phase of operations at the Hitachi Mill of the Nippon Mining Company in Japan where 30,000 metric tons per month of copper are recovered by Denver Sub-A flotation cells. Complete flowsheets, method and equipment descriptions, and engineering data are included. Circle no. 25.

BLASTING BOOK IN SPANISH: A new 28-page booklet, printed in Spanish for the benefit of South and Central American mine, quarry, and construction engineers, explains in detail the millisecond delay or Rockmaster system of blasting developed by the Atlas Powder Company. Copies of "Sistema de Voladura Rockmaster 16" are available by circling no. 31.

LITHIUM GUIDE BOOK: A new guide book on lithium and its compounds is available through the Foote Mineral Company. It contains many new ideas and new applications of lithium chemicals, as well as a complete coverage of the current commercial applications of lithium compounds. For your copy, circle no. 32.

SAFER DRIFTING: Igniter cord, a new device said to be safer and more efficient than older methods, has been adopted by the International Nickel Company for use in drift driving at its mines in the Sudbury District of Ontario. In use now after exhaustive tests at Inco's mines, igniter cord requires a blaster to remain at the loaded face only long enough to light a single fuse, instead of having to light the fuse in each drill hole separately. For further information, circle no. 33.

MECHANICAL GOLD PANNING: Let a gas engine do your work. The Engineers Syndicate, Ltd. has developed a mechanical *gold pan that sells, complete with* motor and pump, for under $300. Said to give higher capacity with less water and to concentrate all heavy minerals, the Mechano-Pan is designed for those hard-to-get-to placers. For further details, circle no. 34.

ATHEY ROCK TRAILERS: A new rubber-tired trailer that's really built to withstand tough rock and mixed material is offered by the Athey Products Corporation. It's a side-dump unit that's designed to be used exclusively with the Caterpillar DW-20 tractor. For further information, circle no. 35.

COMPRESSOR BULLETIN: Descriptive data and engineering specifications on the Cooper-Bessemer M-Line of compressors, 100 to 5,000 hp., is presented in the company's 44 page application bulletin M-70. Circle no. 49.

FUEL FILTRATION: Anyone using gas or oil-fueled engines should investigate Winslow Engineering Company's Free-Flo filters. They're designed to remove mercaptans and foreign matter from petroleum fuels ranging from natural gas to crude oil. Circle no. 50.

TRACK TOOLS: The L. B. Foster Company is offering a new catalog on their complete line of track tools and accessories. Entitled, for some reason or other, "Track Accessories and Tools," it covers everything from Adzes to Wrenches. To get a copy, circle no. 26.

RUBBER HOSE MAINTENANCE: A new bulletin on the care of rubber hose is ready for distribution by Hewitt-Robins. Called "Tips on Hose Care", the bulletin tells what to do and what not to do in the use and storage of various kinds of hose, including steam, fire, oil, gasoline, water, air, suchtion, and sand-blast hose. Circle no. 30.

FOR THE LINGUISTICALLY ERUDITE BLASTER: Whether you speak English, Swedish, French, or German, you'll find the vast accumulation of blasting information contained in the "Manual of Rock Blasting," published by Aktiebolaget Atlas Diesel of Stockholm, Sweden, at your fingertips for ready reference. This surprisingly comprehensive volume, bound loose-leaf for ready additions of future material, sells throughout the world for $15 or the local equivalent. For further information on its availability, circle, no. 39.

LATEST FLOTATION INDEX: 23rd Annual Edition of Dow Chemical Company's authoritative guide to published material on flotation is now being printed. Copies may be obtained by writing to Dow Chemical Co., 310 Sansome St., San Francisco, Calif., or by circling 46.

For Free Product Literature see other side

SUBSCRIPTION RATES:

(including the annual Review and Directory)

NORTH, CENTRAL AND SOUTH AMERICA:	one year $ two years $
OTHER COUNTRIES:	one year $ two years $

SUBSCRIPTIONS IN STERLING	P. J. Sergeant MINING WORLD c/o Barclays Bank,
one year 28/6 two years 50/	72/73 Cheapside, London E.C. 2, England
CANADIAN CURRENCY:	MINING WORLD Royal Bank Bldg., Vancouver,
one year $3 two years $5	British Columbia, Canada

FOREIGN READERS NOTE:
The copy of World Mining you are receiving consists of carefully selected material from the complete American edition of Mining World to which the above subscription rates apply. If you would like to receive the complete Mining World, fill in the lower section of the reverse side of the card at the left. The card must carry proper postage if mailed from a point outside of the United States. You may send payment or be billed later.

Postage Will Be Paid by Addressee

No Postage Stamp Necessary If Mailed in the United States

BUSINESS REPLY CARD

FIRST CLASS PERMIT No. 3430, Sec. 34.9, P. L. & R. San Francisco, Calif.

MINING WORLD—WORLD MINING

121 SECOND STREET

SAN FRANCISCO 5,

CALIFORNIA,

U. S. A.

The "Private Eye" Is An Improved Mineral Detector

The "Private Eye," a portable ten- and electronic detector for locating ied metals and minerals, is made by Radiac Company, Inc. A unique, plified high-efficiency circuit gives it eat sensitivity and power of penetra- to detect metals and minerals in- ding gold and silver. It was designed the ready use of public utility com- ies and engineers, as well as for the spector. The unit is as simple to op- te as an ordinary radio.

Due to its rugged and compact con- ction, the Private Eye may be used er rough field conditions. For fur- r information, circle no. 75.

Two New All-Wheel Drive Trucks Now Available

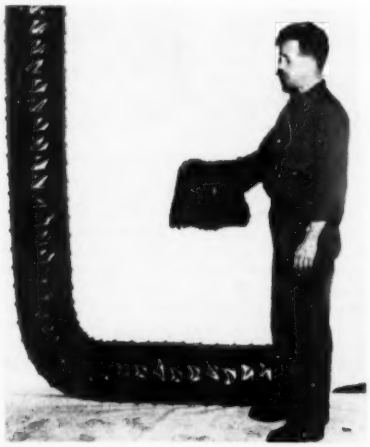
To meet an increasing demand from tor truck users throughout the world "extra-duty" models that will give ditional traction, two new International wheel drive trucks are now being rketed by the International Harvester port Company.

Designated as the R-140-4x4 and 160-4x4 and rated at 11,000 and 16,- pounds gross vehicle weight ratings, pectively, these trucks are powered both front and rear axles through a

sfer case located behind the trans- sion. While the new models retain y of the same components used in ventional rear wheel drive models, they also incorporated specially designed parts manufactured exclusively for all-wheel drive trucks. To obtain available literature on both units, circle No. 63.

Portovent Has Improved Air Flow Characteristics

A new, inexpensive, easily handled, flexible hose is now being introduced by American Ventilating Hose Company under the trade name Portovent. This new



product for fume exhaust and ventilation applications has unusual lengthwise compressibility. It has excellent air flow characteristics, maintains a large cross section even on sharp bends, and is easy to install, transport, handle and store.

The new Portovent is made from cotton or nylon fabrics impregnated with Neoprene compound and spiral wire reinforced. It can be supplied in sizes from 4 to 36 inches inside diameter and is available in any desired length. For information regarding this hose, circle No. 77.

Hydraulic Converters for Medium-speed Engines

Two hydraulic torque converters, newly designed for use with high-torque, medium-speed engines are available through the National Supply Company. These converters cover a power range from 325 to more than 1,000 horsepower.

Performance characteristics and heavy-duty design were provided to meet the

service conditions of many industrial applications where the inherent smoothness of a hydraulic drive is advantageous in handling continuously fluctuating loads or to start and accelerate heavy loads repeatedly. Such service conditions are encountered in power shovels, hoists, cranes, switching locomotives, drilling rigs, and other industrial operations. Circle no. 65.

3/8-Yard Shovel-Crane Is Crawler-Mounted

Schield Bantam Company, the world's largest producer of truck cranes and excavators, has introduced a new ⅜-yard or 5-ton crawler-mounted line of cranes,

back hoes, draglines, shovels, clamshells, pile drivers, and magnet cranes. In the experimental and testing stages for over two years, the new models are now ready for marketing and conform to the company's policy of building a high-quality machine at the lowest price in the industry—in this case, $9,350 f.o.b. Waverly, Iowa.

The units are designed with many important engineering features such as two-speed independent travel, enabling the operator to work a front-end attachment while travelling and swinging the machine, all simultaneously; an undercarriage designed with heavy-duty main frame and deep, rigid side rails; six track rollers to provide even distribution of load over the entire track assembly; and drive power through chain and jaw clutches for each track. Circle no. 57.

Cartoon Booklet on Tractor Accessories

Hyster has published a cartoon booklet on the many versatile accessories the company builds for application with Caterpillar crawler tractors.

Of special interest to mining men is the descriptive and application data on the Hystaway shovel, a unit that is finding

increasing acceptance and application in small open pits and for odd loading and handling jobs in and around larger mines and plants. For a copy, circle No. 69.

Notes From The Manufacturers

Robert S. Bailey has been appointed Southern California representative for the Smith Engineering Works, Milwaukee, Wisconsin. His office will be at 816 West Fifth Street, Los Angeles 17, California, and he will cover the counties south of and including San Luis Obispo, Kern, and Inyo. His firm manufactures "TELSMITH" crushers and other equipment for gravel pits, quarries, mines and contractors.

J. D. GRACE has been appointed sales Manager of the Screen Department of the Crusher Division of the Nordberg Manufacturing Company, Milwaukee, Wisconsin. Mr. Grace has been manager of Nordberg's advertising and sales development department for the past three years. R. E. SCHULZ has been appointed to succeed Mr. Grace. Mr. Grace will be responsible for the sales and market development of Symons horizontal, rod deck and V-Screens and Symons vibrating bar and rod grizzlies.

New vice presidents of Thor Power Tool Company of Aurora, Illinois, include *J. A. Hill* who has been named vice president and sales manager, *John A. McGuire* who has been named vice president in charge of labor relations while retaining his present title of chairman of the executive committee, *B. H. Johns* who has been named vice president in charge of rock drill sales, and *W. B. Hunn,* who has been named vice president in charge of the company's Los Angeles works.

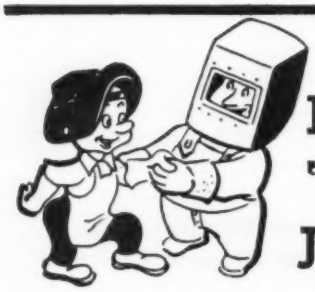
Luis G. Nunez, advertising and sales promotion manager for Westinghouse Electric International Company, recently returned from a two-month trip through 13 countries of Western Europe and the Middle East. His visits intensified the company's efforts to strengthen ties between headquarters and the distributors and to strengthen local advertising. Mr. Nunez' itinerary included Egypt, Syria, Lebanon, Turkey, Greece, Italy, Switzerland, West Germany, France, Belgium, England, Spain, and Portugal.

George E. Stringfellow, senior vice president of Thomas A. Edison, Incorporated, and general manager of the Edison Storage Battery Division, recently announced a $6,000,000 expansion of battery production capacity at the West Orange, New Jersey plant. His announcement came at the closing session of a conference of the battery sales organization in Newark, New Jersey. *Wallace M. Schleicher,* general sales manager of the Edison Storage Battery Division, was chairman of the conference.

William F. Mullins of Werdiger & Mullins Co., of New York was recently elected president of the Industrial Diamond Association of America, Incorporated. *Piet Smit* of J. K. Smit & Sons, Inc., of Murray Hill, New Jersey was elected first vice president and *Walter J. Meinhardt* of the Meinhard[illegible] Company of Chicago [illegible] elected [illegible] ond vice president. [illegible] *Harold E. Robison* of [illegible] Tool Company of Detr[illegible] was elected director as were David [illegible] Industrial Supplies, Inc[illegible] Indiana, *Willard L. H*[illegible] Tool Research Compan[illegible] and *Jan Taeyaerts* of P[illegible] Tool Company of Elgin, Illinois.

C. M. DONAHUE, pictured, and E. G. SANNER have been elected vice-presidents of Mine Safety Appliances Company. Donahue, who has been associated with the company since 1827, is manager of the mining department and the international division of the firm and is a director of Mine Safety Appliances Company of Canada, Ltd. Sanner has been with the firm since 1920 and in 1949 was appointed manager of manufacturing. During the war he managed the company's military production department. He is vice president and a director of Callery Chemical Company, a subsidiary.

John G. Montag has been assistant manager of the export department of Caterpillar Tractor Company and will share administrative responsibilities with assistant export manager, *J. A. Gibb*. Montag has been manager of the Track-son equipment and special projects division of Caterpillar's export department for the past year.



Ind-Air's "Sparky" Joins G.E.

Good news for all users of welding supplies and equipment! Industrial Air Products Co. now, in addition to its many leading lines of welding equipment, has been appointed distributor by General Electric for their welding machines and electrodes.

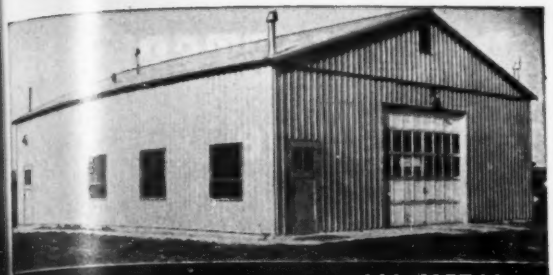
GENERAL ELECTRIC
Authorized Welding Distributor

INDUSTRIAL AIR PRODUCTS CO.
PORTLAND, OREGON • SPOKANE, WASHINGTON
MEDFORD, OREGON • YAKIMA, WASHINGTON

WOULD YOU CLEAN ONLY PART OF YOUR FACE?

No, of course, you wouldn't! Then why clean only *part* of the oil in your engine? Why be satisfied with anything less than the best protection you can give your engine's moving parts? Keep *all* your oil clean, and all the moving parts of your engine protected, with warranted Winslow Full-Flow Filters!

WINSLOW FILTERS
Winslow Engineering Company • 4069 Hollis St., Oakland 8, Cal.



COLUMBIAN ALL-METAL BUILDINGS

Strong • Fire-Safe • Low Upkeep

Columbian All-Metal Buildings are increasingly popular with the mining industry because of their unlimited utility value—for warehouses, engine houses, dryhouses, shops, garages, compressor houses, etc. Prefabricated from quality steel. Sectional construction assures easy, low-cost erection. Exceptionally weather-tight. Rigid, strong, fire-safe. Minimum upkeep. Order from distributors listed below—or write direct for complete information.

COLUMBIAN STEEL TANK CO.

P. O. Box 4048-H, Kansas City, Mo.

Distributors in the United States

Denver Equipment Company
1400 Seventeenth Street
Denver, Colorado

Eimco Corporation
34 South 4th West Street
Salt Lake City, Utah

Distributors—Foreign

Avenida Ejercito Nacional 458-D
Colonia Chapultepec Morales
Mexico, D. F.

• never melts!

• resists cold!

• moisture proof!

2 Superior Lubricants

• Hi-Lo
multi-purpose lubricant

• REZISTOLUBE
gear coating

Hi-Lo never melts! Recommended for all types of bearings, Hi-Lo resists cold, heat, moisture, bleeding and never separates or emulsifies. Unmatched for stability, economy and multi-purpose use. Hi-Lo No. 1 will take care of 95% of all industrial applications.

REZISTOLUBE produced in one grade only for open gear lubrication, is immune to moisture, heat, cold, shock loads and pressures. Applied by paddle or grease gun, Rezistolube is the best buy for the long run!

• for further information, write:

SAHARA *Oil Company*

15 EAST MAIN ST. • DUQUOIN, ILLINOIS, U. S. A.

Reciprocal Trade?

When one reviews an active business life of over 60 years, he will be surprised to find that business seems to move in circles—spirals both up and down. Because of recent activity in Washington with the so-called Reciprocal Trade Agreements, this seems to be an appropriate time to repeat a Lincoln statement that we used just three years ago. "Lincoln had decided views regarding domestic and international trade. With his down-to-earth common sense, he said that when we bought abroad we had the goods, but our money had gone away. That when we bought home products we had the goods, and also still had the money too."

The United States had gained its political independence, but it was still in a colonial relationship to Britain industrially. Following the philosophy of Lincoln, tariff laws were passed which would foster the development of our infant industries. This began our march to become industrially free and great.

In 1895, recurring attacks of malaria forced our move to the United States. We were glad to see the lines of factory smoke-stacks along the railroads, but were puzzled when we noted that there was no smoke coming from them. It was easy to understand the reason when we learned that the administration then in Washington had been elected on the platform—"Tariff for Revenue only—any Protective Tariff is unconstitutional." The incoming flood of foreign goods swamped the new-born industries. We thought we had found the climax when we learned that, notwithstanding a lusty and growing salt industry at Syracuse, New York, the people and eating houses of New York, New York, were using British salt brought in freight-free as ballast in White Star Line vessels. Even in those early days the miners had to take the "knock".

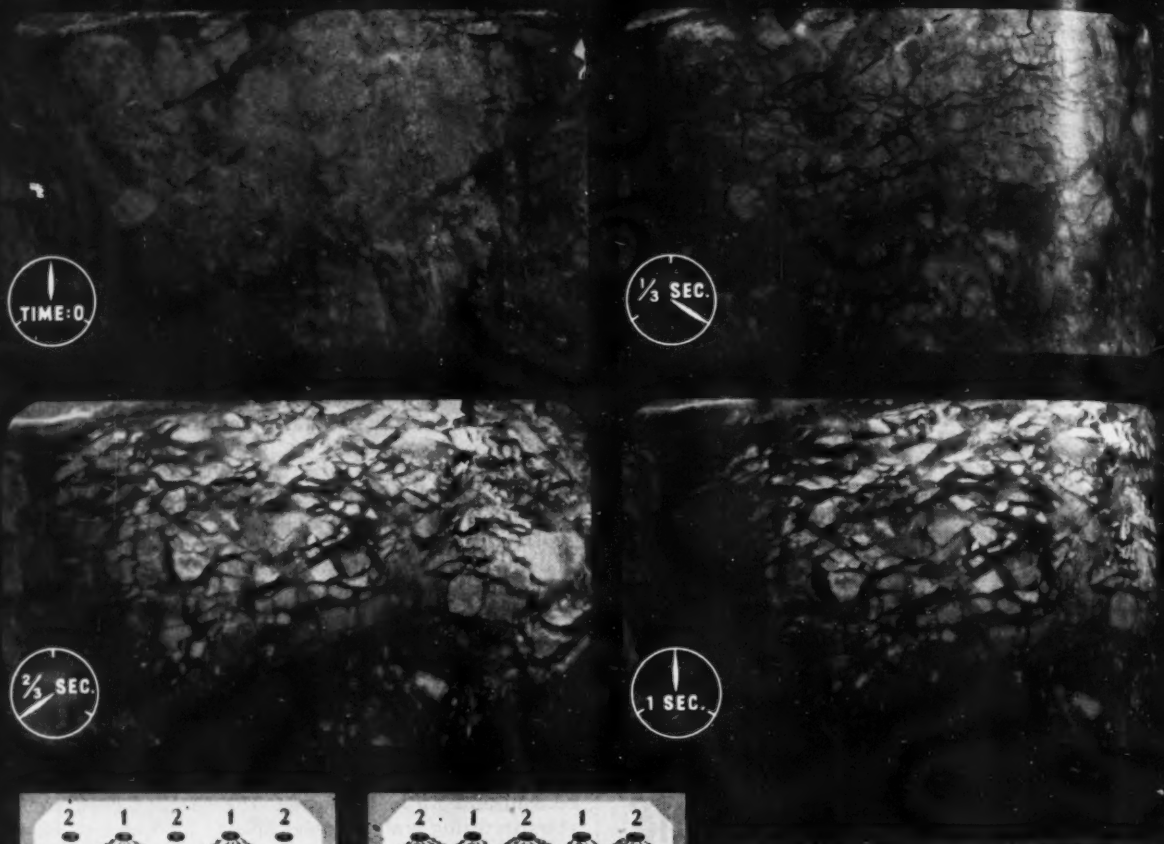
William McKinley had the same idea about protective tariffs and trade as had been held by Lincoln. His election and the passage of the McKinley Tariff Law brought back sanity into our industry picture. By it all segments of our economy were fully protected, with mining being recognized as a major factor. The result was that our manufacturing and business capacity increased by leaps and bounds till we stood in first place in the world. We pass over the fear panic of 1929 which was not an industrial panic. (We do not have industrial panics when goods move freely and storage warehouses are empty.)

The inauguration of the New Deal brought into office men who were wedded to the low tariff idea. The Reciprocal Trade idea was a logical result, and this was immediately in conflict with the Favored Nation Law. This conflict changed the working of both with disastrous results to United States industry, especially mining. At this time we cite only one example—the Canadian zinc deal. Here, percentage-wise is the zinc importation for one year:—Canada 11.3 percent, Mexico 62.6 percent, Belgium 9.1 percent, Norway 2.8 percent, Poland 1.6 percent, Peru 8.5 percent, Argentine 2.2 percent, France 1.7 percent—The same for cadmium—Canada 7.9 percent, Belgium 70.9 percent, Norway 1.8 percent, Poland 0.6 percent, Netherlands 10.1 percent, Italy 8.7 percent—From this we see that in both instances, countries other than the signatory reap a full benefit without rendering to the United States compensating benefits. All the above will be more readily understood when we give the import figures tonnage-wise. It is our mining industry that is being wrecked.

"The Wanderer"

the inside story

Here's how ROCKMASTER® gives better breakage



The first delays put the rock under stress. Then the number two punch of the second delays cuts across the lines of force at points of maximum stress giving maximum breakage.

THIS unusual sequence of photos shows explosives force, first swelling and then bursting a solid face of granite. It is visual evidence of the excellent breakage possible with the ROCKMASTER blasting system used in an alternate pattern.

Theory behind the breaking action of this pattern is that the first delays, detonating within definite limits of controlled timing, place the entire burden under stress. Then at the moment of maximum tension the second delays, also firing with controlled timing, throw the second punch which produces a wedging and bursting action throughout the burden. The explosives gases of alternate ROCKMASTER blasting can be kept under prolonged confinement, reducing both air blast and ground vibration to a minimum.

Alternate action cannot be duplicated by progressive milli-second delay firing methods or by any form of top detonation.

If you want to see how others have profited by using ROCKMASTER milli-second delay detonators with the ROCKMASTER system of explosives choice and loading methods, send for your free copy of the paper "Overburden Blasting Techniques."

ATLAS

ATLAS EXPLOSIV

"Everything for Blasting"

ATLAS POWDER COMPANY • *Offices in principal*
SAN FRANCISCO 4, CAL. • SEATTLE 1, WASH.

precipitates—NORTHWEST

Anaconda Starts Open-Pit Phosphate Work In Idaho

The Anaconda Copper Mining Company has instituted a surface open-pit mining program at its Conda, Idaho phosphate mine, according to L. E. Traeger, general superintendent.

Open-pit work is in two phases. The first consists of open-pitting the hanging and footwall beds above the old underground workings. The broken phosphate rock is conveyed to the top of long ore pass raises and dumped into raises leading to the main transportation tunnel.

The second phase consists of opening a new section of the phosphate beds in a westerly faulted block north of the main transportation tunnel. Dry rotary prospect drilling is underway and overburden stripping is being carried out by the Morrison-Knudson Company.

IDAHO

Clearwater Mines, Inc. is installing a new power generator at its Niagara Creek property in southeastern Shoshone County, Idaho in preparation for an exploration program. A hundred tons of ore stockpiled from previous operations will be sent to a smelter soon for a test run. Values are mostly copper, with some gold and silver. H. G. Loop of Spokane, Washington, is director in charge.

In Custer County, Idaho, *Clayton Silver Mines* is producing about 100 tons of ore monthly from a small stope of high-grade silver ore. Opening of the main lead-bearing ore bodies in the mine on a new 550-foot level will be started in the fall following an additional 70 feet of sinking for sump and pocket. Norman M. Smith is directing engineer.

Day Mines, Inc. of Wallace, Idaho, has adopted a block-leasing system at its *Tamarack* mine. The system enables miners to become independent operators with little capital. Leasers supply labor, powder, caps, fuses, drill steel, bits, and small tools. The company supplies drills, muckers, haulage, equipment and compressed air. Hoisting, mill haulage and milling are charged for at agreed-upon rates and the cost shared equally by company and lessees. Net smelter returns also are split 50-50.

A DMEA field team has approved additional drifting along two well-mineralized structures on the 300-foot level of *Idaho Mining Company's Moon Creek* property northeast of Kellogg. Bruce Allgaier is secretary and manager of the firm.

American Smelting and Refining Company is raising from the 3,000 foot level of the *Vulcan* mine west of Wallace, Idaho to connect with a crosscut being driven from the shaft at the 2,800-foot horizon. Ore in the raise is similar to the rich silver-copper ore opened at the lower level this year. J. E. Berg of Wallace is the firm's Northwest manager.

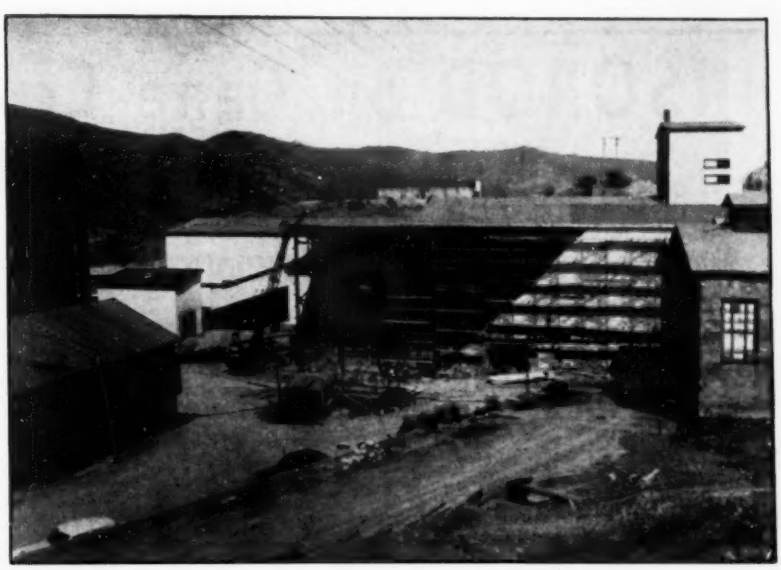
In Boundary County near Leonia, Idaho, *Kootenai Dike Mines* is conducting an open-pit operation on a 40-foot vein containing values in zinc, lead, gold, silver, antimony, and copper. Joe Brandt of Yakima, Washington, contractor, is in charge of work.

Hunter Creek Mining Company ground east of Mullan, Idaho will be explored by a project now and many from the 2,000-foot level of the *Lucky Friday* mine. A crosscut will be driven northeasterly from the *Lucky Friday Silver-Lead Mines Company's* drift and will reach its objective in the *Hunter Creek* property in a shorter distance than originally planned. The Lucky Friday shaft deepening project was completed to the 2,400 level and station and skip pocket cutting are in progress. Lucky Friday and Hunter Creek will share exploration costs and profits. John Sekulic is president of Lucky Friday.

Lucky Friday Extension Mining Company ground also will be explored from the 2,000-foot level of the *Lucky Friday* mine under a newly negotiated agreement. The work would be done from a westerly drift nearing *Gold Hunter* ground held under long-term lease by the Lucky Friday firm. Costs would be paid by Lucky Friday but 40 percent of costs within Extension boundaries would be recovered from Extension's share of production.

Construction of a 150-ton selective flotation mill capable of expansion to 500 tons is nearing completion at *Idaho Consolidated Mines' Twin Peaks* property 18 miles south of Salmon, Lemhi County, Idaho. The 60 by 70-foot mill building is of pumice block construction. A complete mining camp has been installed, with electric power supplied by a Diesel plant. Capital outlay has totaled more than $250,000 since 1950, when the firm acquired the mine under lease and bond from Charles Kapp of Salmon. The property is in the same ore zone as *Calera Mining Company's Blackbird* cobalt-copper mine. Crews are preparing stopes for production. Trucking of concentrates to smelters at Salt Lake City, Utah and Anaconda, Montana is planned. E. G. Wilson of Seattle is company president.

Idaho Goldfields, Inc. has resumed diamond drilling at its *Fourth of July*



BUNKER HILL SMELTER NEARS COMPLETION

Nearing completion as a part of its $3,000,000 improvement program at Kellogg, Idaho is Bunker Hill & Sullivan Mining and Concentrating Company's new lead smelter, shown under construction in the photo above. The plant is divided into three sections for crushing, charge preparation, and pelletizing. The view above shows the outer wall of the pelletizing unit being erected. Here, blended concentrates and fluxing materials will be made into one-eighth to one-fourth-inch-diameter pellets for feed to sintering machines. A pelletizer and dryer have been installed, and a bin and hammer mill will be installed in the area at the left end of the structure. Operations should begin soon. The crusher section includes a tube-like dryer, secondary crusher, and a rod mill. Lime rock, silica, smelter slag, baghouse dust, and zinc residue will be treated in this unit. Construction has started on a new smokestack for the lead smelter a year ahead of schedule. The new stack will be 202 feet high, slightly higher than the old one, and will have an internal diameter of 15 feet at the top.

Canyon property 50 miles east of Spokane. Surface downholes are being drilled to delineate boundaries of a lead-silver oreshoot cut at the portal of the main adit. Howard Hunt of Pinehurst, Idaho has the contract. W. M. Fredericks of Spokane is company president.

Driving of a 1,000-foot drift has been started at the *Wonder* group of claims near Tendoy, Lemhi County, Idaho, being explored by *Defense Metals, Inc.*, of Kellogg, Idaho, under a $68,265 DMEA contract. Thorium and uranium are sought. A portable air compressor, mucking machine, and Swedish drills are in use. Surface trenching was carried out last fall.

Highland-Surprise Consolidated Mining Company has opened good-grade lead-zinc ore on its new 1,650-foot level in the Pine Creek district of the Coeur d'Alene mining region, Shoshone County, Idaho. Lead values are much higher than in upper levels. Drifting toward the oreshoot has been started from the new 1,850-level station. The company has received a supplementary DMEA exploration loan of $42,000, bringing its total government aid to $142,000.

Sunshine Mining Company's 3,400 level southwest crosscut toward the Yankee Girl vein in *Metropolitan Mines'* ground has been advanced about 1,100 feet, leaving approximately 400 feet to go. The properties are in the Coeur d'Alene district silver belt.

The exploration department of the *J. R. Simplot Company's* mining division has been taking mineral test samples on Rabbit Creek near Idaho City, Idaho. The samples are taken to the *Baumhoff-Marshall* separation plant in Boise for analysis. The work is under the direction of George McHugh, manager of mines.

A crosscut adit has been driven 150 feet in the *Cumberland* mine of the *San Francisco Chemical Company* in Montpelier, Idaho. About 400 feet are still to be driven before phosphate beds in the area are intersected. The Cumberland deposits are expected to be a northerly extension of the *Waterloo* phosphate beds where San Francisco Chemical is already carrying on open-pit mining.

The *Bradley Mining Company* has started a new tungsten mining operation nine air miles from its *Yellow Pine* mine in Valley County, Idaho. The new mine known as the *Livingston*, is forty road miles from Stibnite. Scheelite-bearing talus will be mined and the scheelite recovered by jigs.

The *American Metals Company* is diamond drilling at the *Ram's Horn* mine in the Bayhorse district of Southern Idaho. J. Salisbury is the geologist in charge.

Sidney Mining Company has announced plans to deepen the shaft of its mine in the Pine Creek district of Shoshone County, Idaho from the 1300 level to open a new 1500 level. An exploration crosscut into the northern part of Sidney ground from the No. 7 level has been extended 1,700 feet and drifting is underway. Malcolm Brown is superintendent.

First deep-level test of the Coeur d'Alene district's East Silver Belt is under way from the new 2,400-foot level of the Atlas shaft east of Mullan, Idaho. *Hecla Mining Company* is pushing work on a three-shift basis.

The *Calera Mining Company* has installed an automatic dial telephone system for company use at its townsite of Cobalt, Idaho, and at the mine. Also part of the installation is a power line carrier for toll service to Salmon and outside points.

MONTANA

Vincent and Lewis are operating a placer mine on Josephine Gulch about 25 miles northwest of Missoula, Montana. The overburden is stripped by bulldozer and two-yard dragline, then sent through the washing plant to recover the minerals. The water is reused by pumping back to the washing plant from downstream.

ISOROD on Cane-Crushing Rolls

Lengthens Life—
Improves Performance

•

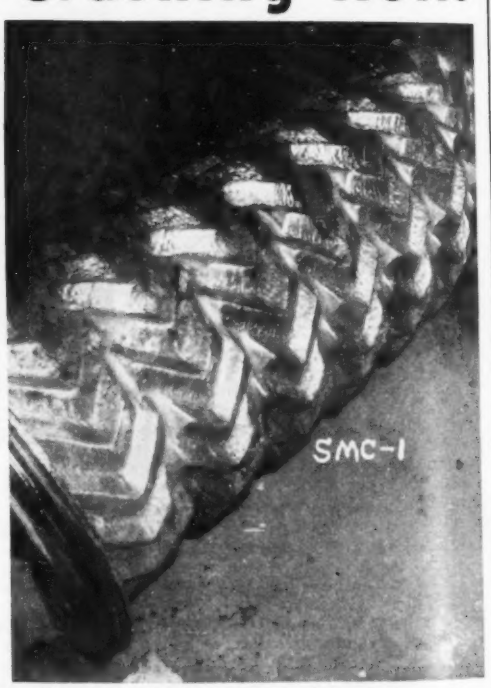
Goes on THIN and SMOOTH

Due to the design of the corrugations on cane rolls a hard-surfacing electrode that is only suitable for flat position welding is not appropriate for this job.

ISOROD is truly ideal for deposit in horizontal position welding.

Call in our field man for a demonstration of this superior hard-surfacing electrode.

He will show you how to preserve the life of these expensive castings and maintain maximum crushing efficiency, as well as other profitable applications.



RESISTO-LOY CO., Mfr., Grand Rapids 7, Michigan

Anaconda Aluminum Company, a subsidiary of *Anaconda Copper Mining Company*, has awarded a contract for the construction of its new aluminum reduction works at Columbia Falls, Montana. *Foley Brothers* of Pleasantville, New York will do the work. The plant is expected to produce about 108,000,000 pounds of aluminum annually when completed.

Henderson Tungsten Company was incorporated by W. A. and Mary H. Noon, J. G. and Antoinette Drent, all of Drummond, Montana.

The *Alps Mining Company* expects its new 50-ton mill at the *Argo* mine in Montana to be in operation shortly. The mill will recover the tungsten mineral, scheelite, as well as other valuable minerals in the ore. After some ore on the dump has been treated, mining is expected to start.

Minerals, Inc. was incorporated recently with $50,000 capital by E. F. Pyle, Leonard C. Wood and Lloyd J. Arnold, all of Helena, Montana.

The *United States Geological Survey* has discovered lines of outcrop of the Phosphoria formation in southwestern Montana, part of which had not been mapped previously and part of which (mainly in the Phillipsburg area) had not been mapped since the discovery of phosphate in the western field. One of the most promising deposits is located in the Centennial Range along the Montana-Idaho state line. Recent sampling and mapping has disclosed reserves of phosphate rock averaging four to six feet in thickness and containing about 31 per cent phosphate. About 50,000,000 tons are estimated in the reserve.

OREGON

Production of diatomite in the Harper-Westfall district of northern Malheur County, Oregon is said to be planned by Portland interests. Claims covering more than 1,200 acres reportedly have been staked and 2,700 acres of land leased.

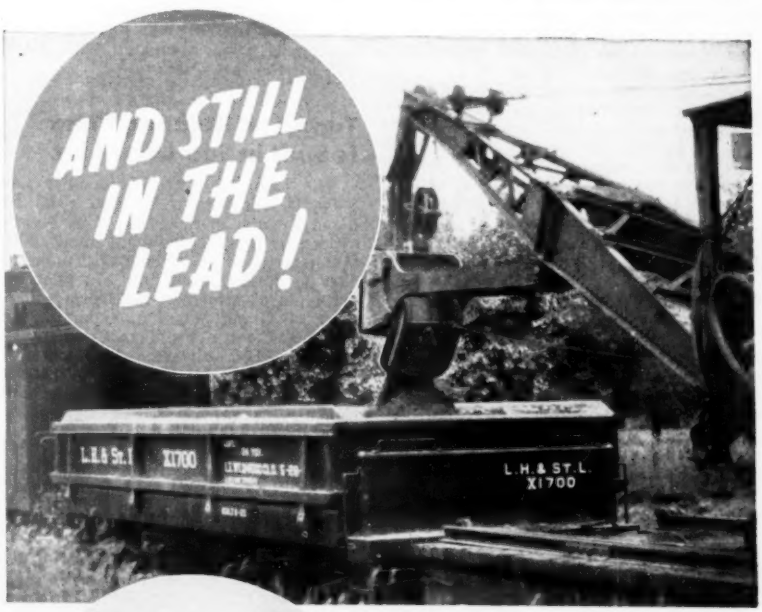
Fifteen men are employed at the *Bonanza* quicksilver mine near Sutherlin, Douglas County, Oregon. Production comes from a Gould rotary kiln. Exploration work is being carried on with aid of a $7,542 DMEA loan. The 830 drift is being extended under the south ore body which was mined above on the 630 south level. Drifting also is planned on the 730 level to open the north ore body. Art Avery is superintendent.

WASHINGTON

Chewelah Copper Mining Company has added two more groups of mining claims to its holdings on Eagle Mountain, Stevens County, Washington. The *Amazon* group of three patented claims were acquired from *Spokane Copper Mines*, Inc. on a lease and profit-sharing basis. The *Independence Keystone* group of four patented claims were acquired from *Western Guaranty Company* and Mr. and Mrs. Albert I. Kulzer of Chewelah on a royalty basis. Adjacent properties owned or controlled by Chewelah Copper are the *United Copper*, *Copper King*, and *Copper Queen*.

Capacity of the Bonanza lead mill is being more than doubled. Earle B. Gibbs of Colville, Washington, managing partner of the *Bonanaza Lead* partnership, has purchased $50,000 worth of new equipment to boost capacity from 100 tons daily to between 225 and 250 tons. He has installed a zinc circuit of eight Galigher Agitair flotation and cleaner cells to handle ore from the *Young America* mine, which the partnership is operating under agreement with *Young America Mines, Inc.* of Seattle. Equipment includes a second ball mill and 60-ton concentrate bin, both manufactured by Union Iron Works of Spokane, and a United Oliver filter. At last report, Gibbs was producing 100 tons of ore daily from the Bonanza Lead mine, which in February was turned back to the partnership by *Anaconda Copper Mining Company* after paying $700,000 on a $2,000,000 purchase option taken two years ago.

Small shipments of lead ore are being made irregularly by A. G. Lotze of Boundary, Washington, lessee, from the *Gladstone Mountain* mine in the Northport district. Production is from an ore "chimney" at a 130-foot depth.



DIFFERENTIAL PRODUCTS INCLUDE:

Locomotives, mine cars, mine supply cars, rock larries, mantrip cars, air dump cars, dumping devices and complete haulage systems.

Over a quarter century ago the first (and original) double-trunnion dump car was placed in service by Differential on the L & N. Sound engineering and careful workmanship were such that this car is still in service — still earning money for its owners.

Such details as hardened, self-lubricating pins in door mechanisms, rolled steel weldments instead of castings (making repairs easier when repairs are necessary)—these are examples of details that put Differential in the lead more than 25 years ago — and keep it there!

Send for Bulletin 56 and get more information on this pioneering air dump car.

DIFFERENTIAL STEEL CAR COMPANY

FINDLAY, OHIO

SINCE 1915 — PIONEERS IN HAULAGE EQUIPMENT

precipitates—ROCKY MOUNTAIN

J. R. Simplot Sinks Shaft At Mines in Bull Canyon

The *J. R. Simplot Company* is sinking an 8-by-8-foot incline shaft 800 feet at its uranium-vanadium mines in the Bull Canyon district of Montrose County, Colorado, according to Louis P. Gaggini, superintendent. The new central shaft will be the center of all mining activities. When the shaft is completed, drifts will be driven to reach several outlying ore bodies located and delimited by surface rotary and diamond drilling.

Sinking is fully mechanized, using jack leg drills for drilling, an Eimco 104 loader for mucking, and Koehring Dumptors for hauling broken rock up the incline to the surface. Plans have been made for completely Dieselizing, using off-track loading and hauling equipment.

Chief Consolidated Will Develop Chief No. 1 Mine

Chief Consolidated Mining Company of Salt Lake City, Utah, plans to spend $1,133,492 for development work at the Chief No. 1 mine at Eureka, Utah. The Defense Materials Procurement Agency will provide $283,373 for the project, and ore sales profits will repay the DMPA.

Projects include 22,000 feet of drifting and cross cutting and 40,000 feet of diamond drilling. The drilling will be done for out lining of ore bodies, not for exploration purposes. Most of the work will be done at the north end of the mine on and below the 2,700-foot level. This includes development of ore bodies that may extend to the 3,100-foot level. New hoisting and pumping facilities will make possible this deeper development.

Company officials state that the program is dependent upon revival of lead-zinc prices. Chief Consolidated reports gross sales of $197,095 for the second quarter of 1953, compared with $204,338 for the first quarter.

Tungsten Refining Plant Is Built in Salt Lake City

Salt Lake Tungsten Company's new $300,000 tungsten refinery at 2160 Indiana Avenue in Salt Lake City shortly expects to begin producing about 200,000 pounds of tungsten oxide monthly. The newly organized firm is a joint undertaking of Minerals Engineering Company of Grand Junction, Colorado and Sylvania Electric Products Company of Towanda, Pennsylvania.

Initial undertaking will be to process some 30,000 tons of tailing owned by Eimco Corporation of Salt Lake City. Another 30,000 tons of tailing from the HM&S Milling Company's gravity flotation mill will be retreated by HM&S, and resulting concentrate refined by Salt Lake Tungsten.

Minerals Engineering will continue ... own and operate its own tungsten ... centrator which is being built at Gol... Montana. This new mill was schedu... to handle 250 tons daily, but may eve... tually be increased to 500 tons per da... Concentrates from the mill will ... shipped to Salt Lake Tungsten for pro... ing.

Building of the refinery has sti... lated other mining activities. Two ma... ing operations underway at Gold Hi... 50 miles south of Wendover, Utah, w... ship to Salt Lake Tungsten, and oth... shipments are scheduled to arrive fr... the Delta, Utah tungsten area. Seve... eastern Nevada mines report plans ... ship concentrates to the new refinery.

Officers of Salt Lake Tungsten ... Blair Burwell of Grand Junction, Co... rado, president of Minerals Engineer... president; E. C. Larsen, vice presid... J. E. McGarr, secretary-treasurer, a... R. G. Sullivan of Grand Junction, L... J. Caine of Chicago, and president ... Caine Steel Company, directors.

COLORADO

The *Resurrection Mining Compa...* mill at Leadville, Colorado has resu... limited operations with employment ... about 50 men. The mill is the only ... in the state that does custom milling ... independent lead and zinc miners. L... ing operations at the Resurrection ... 2 shaft will be under the manage... of Robert L. Jones. *Ibex* and *Gol... Eagle* properties have been leased to ... lis Webster. Other Resurrection le... have been signed with Froelich Ka... Albert Foxall, *Cadwell Mining Comp...* Joseph Glavnich, and John Larsh. R... ney B. Greenlee, general manager of ... company has stated that ore produ... from the leases and ore from ... custom shippers should enable the ... to operate for some time. The Resur... tion Company is still doing explora... work in Iowa Gulch. One surface ... is being operated on a two-shift ba... If drilling is encouraging, further ... ploratory work will be done in the ... (For more details, see the July issue ... MINING WORLD, page 93).

The *American Smelting and Refi... Company* has resumed sinking of its Ir... shaft on Johnnie Hill, Leadville, L... County, Colorado. Sinking of an ad... tional 150 feet of shaft is planne... ASARCO is developing a lead-zinc ... ver ore body in the Garbutt down ra... block in the eastern part of the Le... ville district. F. V. Richard of Salt La... City is western manager of ASARC... mining department.

The Resurrection Mining Compa... equally owned by *Newmont Mi... Corporation, Hecla Mining Company,* ... the *United States Smelting, Mining ... Refining Company,* has started a la... range exploration program in the fa...

SURFACE BUILDINGS AT MOUNTAIN SPRINGS

Surface buildings at the portal of the Mountain Springs mine of the Rico Argentine Mining Company at Rico in Dolores County, Colorado. Approximately 100 tons of lead-zinc-silver ore are mined daily at the Mountain Springs and trucked three miles to the company's differential flotation mill. The Mountain Springs is the largest Rico ore producer at the present time, while some production comes from the Argentine workings. The St. Louis tunnel is being reopened and diamond drilling is underway. The tunnel is being retimbered with steel sets made from 45-pound railroad rail from the abandoned Denver and Rio Grande Southern Railroad. Ore in the Mountain Springs is mined from limestone replacements in the A, C, D, E, H, I, and J beds. Rico Argentine continues to be one of Colorado's major base-metal producers. Sherman B. Hinckley is president and general manager.

gold-copper camp of Summitville, Del Norte County, Colorado. Deep diamond drilling will be done to determine the mineralized content of large copper-bearing veins.

American Smelting and Refining Company has suspended all underground exploration and development work at its Keystone mine in Gunnison County, Colorado. All work is directed toward completion of the 200-ton-per day differential flotation lead-zinc mill.

The *United States Geological survey* has established a large camp in Gypsum Valley, Montrose County, Colorado. The survey has started an extensive diamond drilling program for uranium-vanadium ore in the upper end of Gypsum Valley which was recently withdrawn for mineral entry. Vic Fischer of Grand Junction, Colorado is in charge of the U.S.G.S. uranium investigations on the Colorado plateau.

Melvin Gaymon and Jim Webb have resumed work on the *Pittsburg Placer* in Illinois Gulch, Summit County, Colorado. A dragline is used to uncover and expose the outcrop of a vein of gold-lead ore. The full course of the vein will be located, drainage provided, and a shaft sunk on the ore in preparation for mining operations.

Near Blue Lakes in Summit County, Colorado, Andy Sweet and son of Denver, Colorado are working on a tungsten property owned by Tom Jackson of Breckenridge, Colorado. An ore body has been located and mining will be started this year. Ore will be shipped to the Sweet mill and refining unit located near Montezuma, Colorado, which handles tungsten ores and concentrates.

The *Shattuck Denn Mining Corporation* is contract sinking a vertical shaft on its 157-acre lease four miles from Uravan, Montrose County, Colorado and West of the *La Sal Mining Company's* property. Shattuck Denn was awarded the lease by the U. S. Atomic Energy Commission. The shaft will be sunk 500 feet and the uranium-vanadium ore which has been indicated by AEC surface drilling will be mined. Ore will be sold to one of the existing processing plants operated by the *United States Vanadium Company* or the *Vanadium Corporation of America*. T. W. Newell has been transferred from Bisbee, Arizona to supervise the new development.

Vanadium Corporation of America has obtained approval from the U. S. Atomic Energy Commission to install an additional roaster for processing uranium-vanadium ores at its Naturita, Colorado mill. Ores are mined from the company's own properties and also are purchased from independent producers. The roaster and auxiliary facilities are expected to be in production by late fall or early winter. VCA also has exercised its option to purchase the mill at Durango, Colorado which it has operated under lease from the AEC for the past five years.

Telluride Mines, Inc. of Telluride, Colorado, recently purchased by *Idarado Mining Company*, has shipped its first load of copper concentrate from the newly completed copper flotation circuit. The shipment will go to Montrose, Colorado and from there to American Smelting and Refining Company's smelter at El Paso, Texas. Idarado is a subsidiary of *Newmont Mining Corporation*.

Consolidated Uranium Mines Inc., of Salt Lake City, Utah, has opened three mining camps in Bull Canyon, Montrose County, Colorado. At Mineral Mountain in San Miguel County, Colorado, the company has done exploratory drilling and substantial deposits of carnotite have been indicated, according to reports. Consolidated recently introduced a new method of shaft sinking by drilling. A special rotary drill sinks a three-foot shaft to the underground deposit. Hoisting buckets fit the shaft in the same way that a bullet fits a rifle barrel. According to E. G. Frawley, Consolidated president, the round shafts are cheaper to sink than conventional mine shafts. They require no timbering and may be sunk more quickly.

Moreno Cripple Creek Corporation of Denver, Colorado is producing and shipping uranium ore from the *Snowflake-*

AMERICAN ZINC, LEAD AND SMELTING COMPANY

Buyers of Zinc Concentrates Suitable for Smelting in Retort and Electrolytic Smelting Plants, also Buyers of High Grade Lead Concentrates.

Address Communications to Ore Buying Department

Paul Brown Building
ST. LOUIS, MISSOURI

423 Mills Bldg.
EL PASO, TEXAS

927 Old National Bank Building
SPOKANE, WASHINGTON

P.O. BOX 577
DUMAS, TEXAS

International Smelting and Refining Co.

ANACONDA
from mine to consumer

Buyers of

Copper, Silver & Gold Ores and Concentrates:

Copper Smelter—Miami, Arizona
Address: Ore Purchasing Department
International Smelting and Refining Co.
P. O. Box 1265
Miami, Arizona

Lead & Zinc Ores and Concentrates

Lead and Lead-Zinc Smelter
Lead-Zinc Concentrator
} Tooele, Utah

Address: Ore Purchasing Department

International Smelting and Refining Co.

818 Kearns Building
Salt Lake City, Utah

Please establish contact prior to shipment.

Sunflower claims 16 miles south of Moab, Utah. The firm has leased its 15-acre *Cottonwood* mine 14 miles west of Blanding, Utah, to Nicholas J. Murphy of Moab and Francis D. Nelson of Blanding. Ray A. Bennett is president of Moreno Cripple Creek.

Bids on from 6,000 to 10,000 feet of exploratory drilling for the *U. S. Atomic Energy Commission* in the Marysvale, Utah area were opened recently. Drilling is to determine whether ore is present. E. E. Thurlow is chief of the AEC exploration branch at Salt Lake City.

The Joseph A. Holmes Safety Association certificate of honor was awarded to 2,500 employees of *Kennecott Copper Corporation Utah Copper Division's* open-cut *Bingham* mine in Bingham Canyon, Utah for having operated for 21 months without a fatal accident and for totalling over 10,000,000 hours of work.

Strides in increase of both recovery and capacity output of mills handling uranium and nonferrous metals have been announced by scientists working for the *Institute of Reaction Rate Process* of the metallurgy department of the college of mines and mineral industries at the University of Utah. Dr. M. E. Wadsworth and Dr. Melvin A. Cook and their associates have conducted investigations and tests at *Combined Metals Reduction Company* mills at Bauer, Utah and Caselton, Nevada on flocculation (coagulation) of slimes and surface chemistry which show that by addition of tailor-made organic compounds 100 per cent improvement can be reached in settling and filtering rates. This will increase the capacity of milling operations and will allow for greater recovery because a clearer "supernatant" liquor (fluid floating on top of the slimes) is obtained.

SO ... now we treat all LONG-LIFE TIMBERS with

OSMOSALTS and OSMOPLASTIC

the MINE PROVEN wood preservatives that make timbers last 3 to 5 times longer

Yes, in today's high priced timber and labor market, the cost of mine timbering has skyrocketed. You can cut this cost as much as 50% by using Osmose-treated timbers in all *Long-Life* places above and below ground. Osmose-treated timbers last 3 to 5 times longer and save not only the timber cost but also the LABOR cost of replacement.

Would you like to CUT YOUR *annual* TIMBERING BILL IN HALF? You can by making a negligible investment in Osmose materials and a simple layout for TREATING YOUR OWN TIMBER. Or, if you prefer, we can furnish you with all types of Osmose-treated mine timbers. Let us give you the details! Also, ask us about our new Mine Timber Mix!

Send for this FREE book!
"Force Down Your Operating Cost" is a new 16-page book that shows and tells all about Osmosalts.

DAN KAMPHAUSEN CO.

CONTINENTAL OIL BLDG. DENVER 2, COLO.

These investigations have particular application to leaching of uranium ores. Great reduction of settling and filtering times was also accomplished in experiments at the mills of *Climax Uranium Company* at Grand Junction, Colorado.

Deer Trail Mines of Marysvale, Utah is planning to diamond drill for uranium in an area 3,400 feet from the mine portal where Dr. Paul F. Kerr of Columbia University's geology department discovered U_3O_8. Dr. Kerr has agreed to locate the places where the holes are to be drilled. About 3,000 feet of core drilling is planned. A contract for churn drilling has been let to *C. E. Williams & Son*. A 12-inch hole will be drilled to aid in ventilating the tunnel and will intersect the tunnel 4,650 feet from the portal. Total cost will be approximately $15,000.

The *Vanadium Corporation of America* is now opening the south end of the *Monument Number 2* uranium-vanadium mine in Monument Valley, San Juan County, Utah. The mine has been an important underground uranium-vanadium producer for a number of years, and the open-pit work will speed production of low-grade ores. D. W. Viles of Durango, Colorado is V.C.A.'s vice president in charge of mining operations.

The United States Atomic Energy Commission has four diamond drill rigs in operation on the uranium-vanadium claims of the *Southwestern Development Company* of California. The claims are located in San Juan County, Utah, west of Lisbon Valley and north of the Steen mine of the *U-Tex Mining Company*. Bob Daniels is Southwestern field engineer.

The *Western Mines Development Company* has been diamond drilling in Section 2 north of *U-Tex Mining Company's Steen* mine in San Juan County, Utah, according to Jack Jones, manager. Western Mines is also prospecting and developing near Beaver, Utah, west of the Marysvale district. The geologic setting at Beaver is similar to that at Marysvale where uranium mineralization has been found in monozite and rhyolite.

WYOMING

Intermountain Chemical Company's soda ash plant at Green River, Wyoming is now in operation and will produce at the rate of 300,000 tons annually until two more units are added to increase production to about 1,000,000 tons a year. C. A. Romana is resident manager of the $20,000,000 plant. Intermountain Chemical is an affiliate of *Food Machinery and Chemical Corporation* and *National Distillers Product Corporation*. Food Machinery's *Westvaco Chemical Division* operates the plant and acts as exclusive sales agent.

The Wyoming Board of Land Commissioners recently approved 15 applications for uranium leases on state land in Carbon County, one limestone lease in Albany County, and 13 uranium lease assignments.

The *Columbia-Geneva Steel Division* of the *United States Steel Corporation* has been investigating for iron ore deposits in western Wyoming. C. L. Burrill, Columbia-Geneva geologist from San Francisco, California, made the investigation.

precipitates — SOUTHWEST

Gold Found By Gold Crown Mining Co. In California

High-grade gold ore, much of it in massive crystalline form, was discovered in the Gold Crown mine of Gold Crown Mining Company in California's Allegheny mining district late in July. The district is noted for such mines as the 16-to-1 and the Oriental mines which have produced rich ore in the past.

Ore was encountered when the vein was cross-cut. With the free gold are large masses of arsenopyrite. The footwall is gabbro and the hanging wall is altered slate and serpentine.

After completion of the road to the lower tunnel, drilling was started in mid-April. After 400 feet of drifting along the serpentine contact, the vein was cut. Total length of the drift is 1,500 feet.

An electric power line was built to the mine and modern equipment installed, including mucking machines, side dump cars, and electric tramers. A night shift is to be added to the regular day crew operation.

Dr. Donogh is president of the Gold Crown Mining Corporation and Mrs. Harriette Duke is secretary-treasurer. Fred and Dan Giles operate the mine and Al Novak has been foreman for the development work.

Banner Awards Contract For New Flotation Plant

The Banner Mining Company of Tucson, Arizona, has awarded a design and construction contract for a 400-ton-per-day copper-tungsten flotation plant at its planned Knight mine in Arizona to the firm of Carlile and Associates, Denver, Colorado.

The new mill is scheduled for completion in March 1954 with a May production deadline, under the terms of the Banner-DMPA contract. The new mill will recover chalcopyrite ($CuFeS_2$) by flotation, and scheelite ($CaWO_4$) by gravity concentration. Plans are underway for eventual recovery of molybdenite (MoS_2). Allan Bowman of Tucson is general manager for Banner.

Construction on Gabbs, Nevada Mill is Underway

Toiyable Mining & Milling Company, newly-formed by J. H. Baxter and R. R. Boyd of Gabbs, Nevada, is constructing a 250-ton flotation mill at Gabbs. Tungsten from the Big Top mine owned by Mr. Baxter and Thomas Hancock, eight airline miles south of Gabbs, will be hauled 23 miles down hill from the mine and then five miles to the mill. The mill is expected to be completed next month. Since its opening early this year the Big Top mine has shipped 3,000 tons of ore from its open-pit operations. Plans are now being made to mine with a 35-foot bench, sink a 100-foot shaft near the orebody, and crosscut to determine the extent of the deposit.

Burmister and Maxwell of Mayer, Arizona are mining manganese from an irregular flat streak at the *Burmister* mine, 18 miles southeast of Mayer where a new shaft has just been sunk. Their production rate is about two tons daily, and they have just loaded about 70 tons of high-grade ore for shipment to the Wenden, Arizona purchase depot. The last car shipped contained more than 53 percent manganese.

The *American Uranium Company* of Durango, Colorado is shipping uranium ore daily from its claims 16 miles east of Holbrook, Arizona. The property, located on state lands, is held by P. M. Coston and Hugh Barton, both of Holbrook. Shipments are made by rail to the plant of *Anaconda Copper Mining Company* near Grants, New Mexico. Robert Simpson of Durango, is in charge at the mine.

The *Lead King Company* of Oatman, Arizona, is unwatering the *Ruth* and *Rattan* claims and plans an exploration and development program on the mine's 400-foot level, present depth of the shaft. J. H. McCarthy is in charge, employing a crew of seven men.

The *Goodenough Tungsten Corporation* of Tucson, Arizona, reports the discovery of a high-grade vein of tungsten ore (wolframite) in an old tunnel at the mine. The *Goodenough* is located 10 miles northwest of Arivaca, in the Las Guijas district of Pima County, and has been developed by adits and stopes. Equipment at the mine includes a milling plant with a daily capacity of 50 tons. At present the mill is operated only one shift daily, but plans call for a three-shift schedule soon. J. Arthur Zappia is mine superintendent.

Contract for the construction of 21 miles of transmission line was awarded to *Vyne Brothers* of Prescott, Arizona, and work on the project was started July 7. The 115-kv. line will run from Oracle Junction to properties of the *San Manuel Copper Corporation* and is scheduled for completion within 75 calendar days. Cost of the line is estimated at $350,000, with *Arizona Public Service Company* of Phoenix Arizona, supplying the materials and Vyne Brothers furnishing the labor and equipment. Arizona Public Service holds the franchise to provide electricity for mining operations and for the new townsite of San Manuel. At present, San Manuel Copper has its own Diesel generating plant to supply power for mining operations.

A compromise has been reached whereby construction of the town to serve *San Manuel Copper Corporation* will be handled as a joint venture by *Del E. Webb Construction Company* of Phoenix and *M-O-W Homes* of Bellflower, California. The latter company is owned by *Aldon Construction Company* and *Louis Lesser Enterprises, Ltd.* Contract for the construction of 1,000 rental housing units was awarded M-O-W by the Housing and Home Finance Agency, and reversed the original plans of San Manuel to award the contract to Del E. Webb. It became necessary to reopen bidding for the housing project when the government declared the townsite a critical defense housing area.

A test shipment of 50 tons of uraninite has been made from the *Red Bluff*

INTERNATIONAL MINERALS' NO. 4 SHAFT

The new no. 4 shaft of International Minerals & Chemical Corporation's Carlsbad, New Mexico potash operations is open, following completion of a drive from the No. 3 shaft into the new extension of the mine. All men working in the southwest extension will enter the mine through the new shaft. Hoisting equipment is adequate to handle any load of men, equipment, or materials for the entire area. Operations at present are centered about midway between the No. 3 and the No. 4 shaft so the latter will provide the shortest possible trip from the shaft to the workings. The No. 4 shaft, located in the southwest extension, cost close to $500,000 to develop. Before the move to the new shaft was completed, over a mile of road was surfaced at a cost of more than $10,000 to make the trip from the highway easier.

Mines, 35 miles north of Globe, Arizona, to the new *Anaconda Copper Mining Company* plant at Bluewater, New Mexico. The mine is owned and worked by Ethel Schell Larsen. Carl Larsen is in charge of mining.

The *Bosley and Stovall Manganese Company* is shipping about two carloads of manganese concentrates weekly from its operations in the Long Valley area south of Flagstaff, Arizona. These concentrates, said to run about 45 percent manganese, go to the Pueblo Ordnance Depot at Avondale, Colorado. The ore is mined in open-pit operations using power excavators and loaders, then trucked some 30 miles to the firm's mill at Mormon Lake. The resulting concentrates are then trucked to Flagstaff, another 30 miles. Howard V. Bosley is in direct charge of the work and employs from 15 to 18 men in mining, milling, and trucking operations.

Shipments of manganese ore are being made by Rupert Beyerle of Nogales, Arizona, from his lease on the *Eastern Extension Enterprise* claim, a part of the old *Mowry* mine. The ore, assaying better than 20 percent manganese, is trucked to Patagonia then sent by rail to the government purchase depot at Deming, New Mexico. A crew of 10 men is employed.

Larger hoisting and compressor equipment has been installed at the *Sunset* mine in the Mineral Hills district of Arizona by the *American Copper Company*. The firm took over the property several months ago and is now deepening the 600-foot main shaft to reach the sulphide zone. It is estimated that this zone is about 300 feet below the bottom of the present shaft.

Anthony and James Giacoma of Tombstone, Arizona, are shipping from 75 to 100 tons of ore monthly from their lease on the *Costello Group* near Gleeson. The ore, practically all in the form of carbonates, is said to average about 20 percent lead, 5 to 6 ounces silver, and a small amount of gold. Three men are employed in the work.

Ray Pointer is directing exploration work at the *Black Hawk* manganese mine, about 20 miles southeast of Klondyke, Arizona. The property is owned by Gard East of Pima, but under lease to C. J. Rodham. The ore occurs in narrow streaks and seams and is recovered by trenching, then screened and hand-sorted.

Shipments at the rate of 250 tons monthly are being made to the Deming Manganese Depot by Alex de la Ossa of Patagonia, Arizona from the *Golden Gate* mine. Mining is from an open cut about 20 feet deep, and the ore is loaded into trucks for haulage to Patagonia, nearest rail shipping point. The claim, at one time known as the *Bullwacker*, is owned by Karl Peterson of Nogales, Arizona. Mr. de la Ossa has also shipped a carload of manganese ore to the Deming Manganese Depot from his lease on the *Enterprise* mine. This property, a part of the Mowry group, is located about 14 miles south of Patagonia. The ore is mined from an open cut about 30 feet deep, hand-sorted as it is shoveled into the mine car, then trucked to Patagonia for rail shipment to Deming. De la Ossa plans to ship about one carload weekly, employing a crew of three men. Previous mining operations at the Enterprise were conducted for the lead and silver content of the ore.

A DMEA loan has been granted to the *Tuolumne Gold Mines Inc.* of San Francisco for exploration at its Copper *Bluff* mine in Humboldt County, California. Exploratory work, which will take about three months, is now underway. A. Vannini is president and general manager.

Tungsten purchases at the San Francisco office of the General Services Administration under the Government Tungsten Purchase Program now aggregate 232,757.3731 short ton units of WO_3 valued at $14,547,485.70. Through

An Unfailing Market for:

GOLD • SILVER • COPPER
LEAD • ZINC

Ores • Concentrates
Bullion • Precipitates
Furnace Products

ASARCO *American Smelting & Refining Co*

405 Montgomery Street, San Francisco 4, Calif.
700 Pacific Nat'l. Life Bldg., Salt Lake City, Utah
P. O. Box 1111, El Paso, Texas
Tacoma 1, Wash.
607 First National Bank Bldg., Denver 2, Colorado
810 Valley Bank Building, Tucson, Arizona
East Helena, Montana

FOR SCHEDULES, FREIGHT RATES, ETC. WRITE TO YOUR NEAREST OFFICE

July 2,277 Certificates of Authorization (meaning the right to sell to the government) had been issued and 275 lots of ore had been delivered by 43 participating shippers. During the month of July, seven carloads of tungsten concentrates totalling 574,478 net pounds were shipped direct to Wolf Lake Facility at Hammond, Indiana from Western mines. In addition 126,673 net pounds of concentrate were trucked to the Butler Road Warehouse in South San Francisco, California. The month's total of 701,151 net pounds fell below the record peak in May of 1,071,185 pounds but showed a substantial increase over the 315,322 pounds shipped during June.

Molybdenum Corporation of America's newly enlarged mill at Mountain Pass, California is now running at the rate of 2,500 to 3,000 tons per month, to produce concentrates from the rare earth minerals on the property. Additional land has been acquired by the firm to assure an adequate water supply for the operation. Marx Hirsch, president of the company, reports that production is being fully sold and that development of uses for the rare earths in the steel industry is being carried on which will probably provide substantial markets for the concentrates.

An unusually rich deposit of tungsten ore has been reported near Bass Lake in Fresno County, California. The discovery was made by Joe Kossan of Friant who has been prospecting in that area for several years. *Pacific Mill and mine Supply Company* reportedly will assist Mr. Kossan in financing erection of a mill at the mine site.

San Luis Obispo Mining Company, Ltd. is mining for chrome at its open-pit operation near San Luis Obispo, California where a large supply of milling ore is reported to be available. An Ellis-type mill, equipped with three tables and jig, has been installed. The company holds the *Miller Seely* property which comprises 14 claims, and the *Thornberg* property with five recorded claims. Al Tieman is manager.

Bill Wilkinson is reported to be shipping gold to the United States mint from his *Lucky Boy* mine in the Rand district of California which he located 56 years ago. Another *Lucky Boy* mine in the same district was owned by Pete Peterson, but the two locations are not the same.

R. G. Mitchell, Bert Wegman, and Bill Hackman are reported to have sunk a shaft 125 feet at the *California* gold mine in the Rand district of California. The mine is being operated by Judge Charles G. Potter of San Bernardino. A hoist and a compressor are being installed. From a raise to the 100-foot level, the miners plan to drift west in an attempt to find a possible junction of veins.

Gold ore is now being produced from a new level 300 feet below the main adit of the *Oriental* gold mine near Alleghany, Sierra County, California. A 75-ton mill at the mine site treats the ore by flotation, concentration on tables, and amalgamation.

Ed. J. Kohler in North San Juan, California is mining some limonite iron ore at Gale's Orchard in Sierra County. The initial assay disclosed that the ore contains 52 percent iron. A bulldozer is removing the comparatively light overburden from the 1,700-acre site.

Retimbering of the *Central Eureka* mine shaft from surface to the 3,200-foot level has been in process for the past year by the *Central Eureka Corporation* preparatory to major development work. June gold recoveries in the 300-ton-per-day mill averaged $30 per ton as compared with $17.50 per ton.

Barium Products, Limited, a wholly owned subsidiary of the *Food Machinery Company* of San Jose, California, has opened a new open-pit barite mine twenty miles south of Battle Mountain, Nevada. Known as the *Mountain Springs* mine, it is now producing 250 tons of ore per day. A ¾ yard Diesel shovel and trucks are used to haul the broken ore to a nearby screening plant. Undersize, minus ¾-inch, is discarded and the oversize is shipped to the firm's chemical plant at Modesto, California. The deposit was delimited and tested by long hole drilling from the surface during the last six months. Jim Jurey of Battle Mountain is foreman.

The *Wharton Jackson Co.* of Los Angeles, California has been appointed exclusive sales agent for *Huntley Industrial Minerals, Inc.* of Bishop, California. The new agency will handle the wide range of nonmetallic minerals, including talc, pyrophyllite, mica, asbestos, clays, and special aluminum and magnesium silicate pigments produced from mines and plants of Huntley in California, Nevada, and Arizona.

The Inyo County Board of Supervisors has authorized the district attorney to apply for acquisition of land upon which a public housing project now stands. The project is located in Pine Creek Canyon and largely serves the employees of *U.S. Vanadium Company's* tungsten mine at Pine Creek, California. The land covers about 19.1 acres and belongs to the federal government.

Analysis of 50 years of Boyles drilling experience shows that under the most adverse conditions, costs for exploratory diamond core drilling are consistently 90% under drifting expenditures. Equivalent data thus made available at a vast saving of both time and money! Whether it's diamond core drilling for exploration, long-hole drilling, tunneling or rock breaking . . . Boyles have the equipment and the technical know-how. Consult a Boyles engineer.

Boyles Bros. DRILLING COMPANY

1321 SOUTH MAIN STREET • DIAL 84-4401 • SALT LAKE CITY, UTAH

BRANCH OFFICES

Colville, Washington — Telephone 181

Leadville, Colorado — Telephone 326

SOUTHWEST PRECIPITATES

The *Thunder Mountain Mining Company* of Orleans, California has submitted a sample to the Colorado Assaying Office at Denver for a spectrographic analysis. The sample was chiefly hard white quartz, and considered to be valuable for its gold and silver content.

Gabbs Exploration Company is mining about 90 tons of scheelite ore daily from its *Victory* mine near Gabbs, Nevada. A rod mill with jig and table concentrating plant treat the ore on a three-shift-daily basis. Flotation equipment is now being added to treat the table tails after rejecting, by screening, the plus 80 mesh. Lee D. Dougan is president and general manager, Bart VanVoorhis is assistant manager, and Jim Corlett is mine foreman.

Consolidated Coppermines Corporation of Kimberly, Nevada has withdrawn from the *Dixie Valley* copper property in Churchill County, where it had done some drilling earlier in the year.

Nevada Mines Developers, Inc. is developing the *Little Jupiter* gold mine in the Grass Valley district south of Winnemucca, Nevada. Camp buildings reportedly have been completed, and deepening of the shaft is underway. D. C. Wray is general manager and president; E. L. Crom is vice president and M. W. Wooley is mine consultant.

About 20 tons of tungsten ore are being produced daily from the *Commodore* mine leased and operated by the *Inca Development Corporation* in Nye County, Nevada. The ore is processed in the El Capitan mill nearby. R. H. Harris is superintendent of both mining and milling operations; J. L. Sloan is mine foreman and Martin Chiatovich is in charge of the milling operations.

Kennametal's Nevada Scheelite Division reports an output of 90 tons of ore per day at the *Leonard* mine northeast of Hawthorne, Nevada. Two shifts are operating in mine, while three shifts work in the 150-ton mill. In addition to development work, the company is also diamond drilling for other ore. E. M. Colwell is general superintendent.

The *Garnet King* tungsten mine, which has been shut down for several months, will reopen shortly. The property is located in the Palmetto mining district of Nevada.

Lewis C. Mehan of Redwood City, California, and W. W. Whitaker of Fallon, Nevada have leased 1,200 acres of the *Eureka Hamburg Mining Company's Leonard Creek* property 100 miles northwest of Winnemucca, Nevada. A bulldozer, carryall, dragline, and other equipment have been moved to the site and the operators expect to be able to move 100 yards of gravel per hour to the washer when operating at capacity. Gold is the primary objective of the placer operation but some silver is expected as a byproduct.

The *Golden Horseshoe Mining Company* has purchased the *White Cloud* group of claims in Seven Troughs mining district of Nevada and is planning immediate development of the mine. A bulldozer is being used in rebuilding three miles of road from Vernon to Signal Peak near which the property is located. The firm acquired the White Cloud group of five claims from Dr. Pepper of Palm Springs, California. In 1950, the firm acquired 11 claims and a 30-ton ball mill from Mrs. Vera Johnson. Gold ore is expected to be found in the bottom of 15- to 30-foot shafts sunk by former operators. Dr. Herbert Larsen of Guerneville, California is president of Golden Horseshoe; Dr. William Makaroff of Guerneville, vice president; and John Van Bussell of San Francisco, secretary-treasurer.

Dodge Construction Company's recent iron ore diamond drilling project has been considered highly successful with 10 holes, sunk 120 feet deep, each showing high-grade iron ore at depth and one in solid ore from top to bottom. The firm recently made a shipment of 44 carloads of high-grade iron ore to a federal government location in Washington.

At the *Summit King* mine north of Tonopah, Nevada, *Tonopah Development Company's* winze has attained a depth of 250 feet and preparations are being made to drive a crosscut which is expected to intersect the vein system within 25 feet. A station is being cut at this level (approximately the 550-foot level) and the winze will be deepened another 30 feet to make pocket for receiving the muck.

The *Great Western Mining Company* has placed its mica mine at Mora, New Mexico in the hands of receivers. According to estimates made by the Colorado School of Mines Research Institute there are more than 7,000,000 tons of mica-bearing pegmatite in the mine, containing 11 percent mica. Last November the plant was shut down for installation of more equipment but was never reopened.

A newly formed organization, the *Petaca Mining Corporation*, has taken over all assets of the *Petaca Mineral Corporation* of New Mexico. Stockholders have received certificates of indebtedness from the new firm totaling $10,000,000. The new management plans to work the mica property which is located near Petaca, New Mexico in northern Rio Arriba County. A $250,000 mill with a 100-ton-per-day capacity reportedly is being designed to recover columbite-tantalite, monazite, samarskite, and beryl as by-products with mica as the chief mineral. Mining will be by open pit.

The New Mexico Bureau of Mines and Mineral Resources will continue its mineral survey of Navajo lands under a contract which has just been renewed by the United States Bureau of Indian Affairs. $27,000 has been appropriated to finance the study which will cover a 4,000-square mile area. A similar contract awarded a year ago provided $40,000 for prospecting and geologic mapping of some 500 square miles. A report on this survey will be published soon. The purpose of both surveys has been to find and evaluate mineral resources which may be of economic advantage to the Navajo people. The new survey is restricted to industrial minerals and rocks, such as bauxite, bentonite, diatomite, gilsonite, limestone, and various sands and clays.

WEIGHTOMETER

Use the WEIGHTOMETER for accurate, dependable tonnage controls in mills and concentrators. Since 1908 WEIGHTOMETERS have helped many mines and mills to obtain efficient operation. Automatically records and totalizes without interrupting flow.

Easily installed, simple, fully enclosed, durable.

MERRICK SCALE MFG. CO.

172 Summer Street

PASSAIC NEW JERSEY

CHANGE OF ADDRESS

CIRCULATION DEPARTMENT

MINING WORLD with which is combined the Mining Journal

121 Second St., San Francisco 5, Calif.

Please change the address of my Mining World subscription.

NAME.....

OLD ADDRESS .....

NEW TITLE OF POSITION .....

NEW ADDRESS.....

NEW COMPANY CONNECTION.....

Crane Co. Plans Titanium Plant With DMPA Aid

The U.S. Defense Materials Procurement Agency has contracted with Cramet, Inc., a subsidiary of Crane Company of Chicago, Illinois, for construction of a $25,000,000 plant for production of titanium sponge and titanium ingots. When the Cramet plant is completed, it will be the biggest titanium operation undertaken so far in the combined government and industry expansion program for the so-called "wonder metal."

Cramet is a wholly owned subsidiary formed by the Crane Company to construct and operate the proposed plant. The plant is scheduled to start partial production by early 1955 and full production a year later.

Crane Company has been operating a titanium pilot plant at its Chicago works for two years and has developed modifications of the Kroll process which will be employed in the new plant. This process calls for treatment of the titanium ore with chlorine to form titanium tetrachloride. This is then reduced by magnesium to form titanium sponge which is crushed and melted to make ingots.

The government will advance funds up to $24,950,000 for construction and equipping of the plant which will have a capacity of 6,000 tons of ingots a year. The government has an option to buy up to 7,500 tons of titanium sponge during the five years of the contract and is required to buy 6,000 tons.

Training, Roof Bolting Are Topics at Safety Meeting

Symposiums on roof bolting and training methods will highlight the mining sessions at the 41st National Safety Congress and Exposition which will be held at the Conrad Hilton Hotel in Chicago, Illinois from October 19 to 23.

Topics to be discussed at the first session on Monday, October 19, include "Nondestructive Method for Mechanically Testing Steel Wire Hoisting Ropes Under Operating Conditions" by W. H. McPherson, consulting engineer for the McPhar Engineering Company of Canada, Ltd., and "Occurrence of Radon in Some Western Mines" by A. D. Look, Chief of the Accident Prevention and Health Division of the U.S. Bureau of Mines, Phoenix, Arizona.

On the agenda for Tuesday are "Radio Communications in Underground Iron Mines" by E. D. Cory, chief electrical engineer, for the Cleveland-Cliffs Iron Company, Ishpeming, Michigan, and "Causes and Control of Rock Bursts" by P. J. Shenon, consulting geologist of Salt Lake City, Utah.

Wednesday's session includes "Job Training at the Butte Mines of the Anaconda Copper Mining Company" by Lester Bishop, assistant research engineer for Anaconda, at Butte, Montana, and "Safety Training at the Tennessee Copper Company" by S. W. Sharp, safety director of the Tennessee Copper Company in Copperhill, Tennessee. One of four topics in Thursday's discussions on roof bolting will be "Roof Bolting in the Butte Mines" by V. D. O'Leary, superintendent of Anaconda's Mt. Con mine in Butte, Montana.

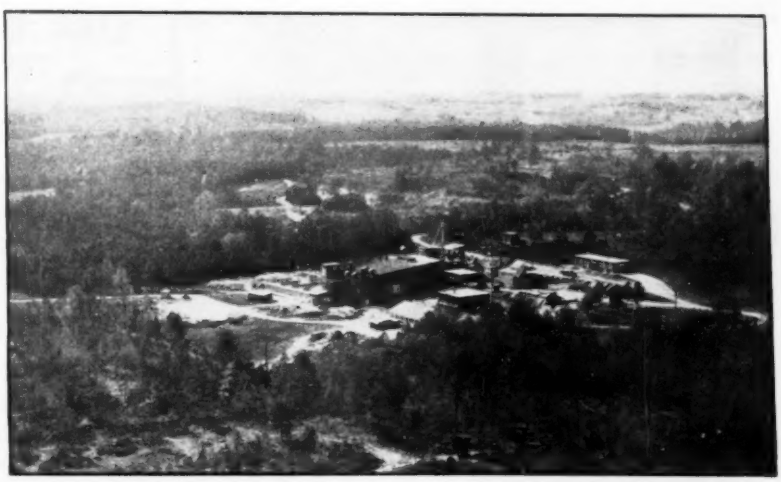
Ground Mica Production Rise in North Carolina

Demand for dry-ground mica produced by plants in the Spruce Pine area of North Carolina has been increasing since mid-February, and, according to unofficial reports, plants are running at capacity. Operations are on a 24-hour basis, six days a week.

It is reported that dry-grinding plants are producing somewhere between 45,000 and 50,000 tons a year of the ground mica. Selling prices range from $30.00 to $32.50 a ton for the bulk of the tonnage. Some of the best quality dry-ground mica sells for as much as $57.00 a ton.

Meanwhile, the government purchasing depot at Spruce Pine, North Carolina has been authorized to purchase green mica at a top price of $56.00 a pound. The green mica will be subject to the Q meter test. After extensive testing by the U. S. Geological Survey, the Tennessee Valley Authority, and the North Carolina Department of Conservation and Development, the following conclusion was reached: that there is no intrinsic difference, grade for grade, between clear ruby and clear non-ruby mica from the Southeastern states and no discernible difference between clear domestic micas and clear ruby mica from India. For more details about green mica purchases, see the July issue of MINING WORLD, page 101.

All production and development work at the Bonne Terre, Missouri mines of the *St. Joseph Lead Company* has been discontinued for the past few weeks while major repairs are being made. The wooden part of the headframe is being replaced with steel construction to make it fire-resistant. A large ore bin is being installed to provide the mill with a small reserve supply in case of temporary hoisting delay. Under the old arrangement, ore was dumped directly into the primary crushers and any slight delay in hoisting immediately affected the mill feed. The hoists and air compressors are



FOOTE MINERAL'S SPODUMENE OPERATION

An over-all view of the Kings Mountain operation of Foote Mineral Company in North Carolina where additional mining, milling, and processing equipment have been installed to triple output of spodumene ($LiAlSi_2O_6$). Included in the new equipment is a fine ore washing circuit in the spodumene mill, where a 24-inch Wemco classifier will deslime (clay) 1¼-inch screen undersize ahead of fine crushing. This project is part of a $3,000,000 expansion program undertaken by Foote to meet the increased military and civilian demands for lithium chemicals. The world's largest lithium chemical plant has been constructed by Foote at Sunbright, Virginia, and is expected to be in regular production shortly. At Kings Mountain last year, the firm acquired surface rights to about 37 acres of land adjoining other holdings in the area. The new tract is a portion of the Park Yarn Mill to which Foote obtained mineral rights in October 1951. During the first half of 1953, the company increased its geological and exploratory activities for other lithium-bearing deposits. Some of this work is being done under a grant from the Defense Minerals Exploration Administration.

being relocated, necessitating changes in the buildings which house this equipment. During the changeover, the mill has been operating on chat which has caused considerable loss of concentrate production.

Eagle-Picher Company reports that construction of the new roasting, sintering, and sulphuric acid plants at Galena, Kansas is proceeding on schedule and operations are expected to start in about a year. Net sales of the company and its domestic subsidiaries during the first six months of 1953 were the largest for any first half-year period in the company's history. Net profit both before and after provision for income taxes was higher than for the corresponding 1952 period. Consolidated net profits for the six months ended May 31, were $1,787,107, compared with $1,709,647 in 1952

A test lot of 300 tons of copper-bearing rock was recently shipped by the *Roob-McDermid* interests who are reworking the old *Winona Mining Company* property at Winona, Michigan. The material was shipped to the Freda mill of the *Copper Range Company* where results will decide the future of the operation.

A continuous electrolytic process for producing high-purity alumina from low-grade domestic ores is being licensed through the *Lobeth Corporation* of Chicago. The process was proved after more than a year's operation in a pilot plant in Europe. It is continuous and recovers 99 to 100 percent of all reagents used; it has been operating purposely with low-grade kaolin clay (10 percent alumina and 80 percent silica) to prove that there is practically no limitation on the impurities it can handle.

A $14,000,000 titanium dioxide plant will be constructed by the *American Cyanamid Company's Calco Chemical Division* on a 1,600-acre tract near Savannah, Georgia. Construction will begin toward the end of this year and completion date is set for early in 1955. This will be Calco's third titanium dioxide facility. The others are located at Piney River, Virginia, and Gloucester City, New Jersey.

A record cargo of more than 20,000 tons of iron ore was delivered to the Bethlehem Steel Company's Lackawanna, New York plant in July by one of the firm's new super ore carriers operated by the *Bethlehem Transportation Corporation*, a subsidiary of Bethlehem Steel. The huge new freighter, the Johnstown, has an over-all length of about 625 feet, a keel length of 610 feet, and a beam of 70 feet. Another Bethlehem carrier, the Steelton, recently delivered 17,464 tons of ore. The company's new facilities for handling these huge shipments (ordinary cargo is 10,000 tons) have been tested successfully. Part of the program included deepening of the channel in its own slip and expanding ore handling facilities.

The *New Jersey Zinc Company* will start shaft sinking operations shortly on its property one mile south of Jefferson City, Tennessee. The property was acquired in 1947, and subsequent drilling has indicated that the orebody is a lead-free zinc sulphide typical of other zinc occurrences in eastern Tennessee. The initial shaft will be sunk approximately 1,200 feet. Plans also call for the construction of a 1,000-ton-per-day mill

Correction

Due to an unfortunate typographical error, three figures were omitted from the pounds of recoverable metal at the new Young mine of the American Zinc Company of Tennessee as described on page 52 of the July issue of MINING WORLD. The correct figure is 1,200,000,000 pounds of recoverable metal in 1,000,000 tons of zinc concentrate.

a SQUARE beyond compare!

This close-up of Hendrick Perforated Metal Plate shows no ordinary screen. No other screening medium can equal it for uniformity of mesh, for non-binding clearance and for unparalled long service life.

Flat or corrugated Hendrick Metal is available in any desired shape and size of perforations in high carbon steel and stainless steels and other commercially rolled metals. Decks can be changed fast and efficiently—cutting time and labor costs. For more details write for information.

Hendrick
MANUFACTURING COMPANY
44 Dundaff Street, Carbondale, Pa.
Sales Offices In Principal Cities
Perforated Metal • Wedge-Slot Screens • Shur-Site Treads • Armorgrids
Architectural Grilles • Mitco Open Steel Flooring • Perforated Metal Screens

LIKE HAM AND EGGS—

That's the way Coast's *Safety Fuse* and *Spittercord* go together. Coast's Spittercord greatly reduces time at the face required for spitting. It spits all fuses on a round from one point of ignition. Assures positive rotation of firing. This is just the dish for greater blasting safety and efficiency.

REMEMBER COAST'S SPITTERCORD

PRIMACORD · BICKFORD
Hot Wire Fuse Lighters
Detonating Fuse
Safety Fuse
Celokap

COAST MANUFACTURING & SUPPLY COMPANY
ESTABLISHED 1867
LIVERMORE, CAL.

Ask your powder supplier or write for literature

COAST MANUFACTURING & SUPPLY CO.
LIVERMORE, CALIFORNIA

Hudson Crawford, Tennessee superintendent for New Jersey Zinc, will be in charge of these operations.

Manganese, Inc. expects to have its pilot plant in partial operation this month at Coxton, Pennsylvania. *Southwestern Engineering Company* of Los Angeles is in charge of construction. The plant will be the first to recover ferromanganese from open hearth steel furnace slag.

A mineral science building is being added to the campus of the Pennsylvania State College. It is expected to be completed for use during the fall term.

find

vital war metals!

with Ultra-Violet

MINERALIGHT

MINERALIGHT instantly identifies tungsten, mercury and many other valuable minerals now in great demand for re-armament.

MINERALIGHT models for every requirement Money-back guarantee.

ACTUAL ATOMIC BLAST SAMPLE! Send 25c for new mineral specimen from 1st atomic blast at Alamogordo, New Mexico.

FREE! Send for brochure MW "Prospecting for Scheelite (tungsten) with Ultra-Violet."

ULTRA-VIOLET PRODUCTS, INC.
145 Pasadena Ave., South Pasadena, Calif.

Spiral Weld

STEEL PIPE

For air, gas, steam, oil and water lines
4" to 12" O. D. • 10-12-14 Gauge
20' & 40' Lengths • Choice of ends
Can be supplied to 36" O.D.

HIGH TEST . . . LIGHT WEIGHT
ECONOMICAL LAID COST

also
STAINLESS STEEL PIPE, FLANGES, ELBOWS
NEW ALUMINUM PIPE
RECONDITIONED PIPE, VALVES, FITTINGS
MODERN PIPE FABRICATING FACILITIES

•

Send specifications for estimate or write for folder

PACIFIC PIPE CO.
407 FOLSOM ST. • SAN FRANCISCO 5
If it can be made of pipe . . . We Can Make It

Trenching and drilling by the *U.S. Bureau of Mines* has revealed substantial recoverable reserves of red iron ore in central Alabama. Samples have been obtained from deposits in the Woodstock and Bucksville areas of Jefferson, Tuscaloosa, Bibb, and Shelby counties. Ultimately, beneficiation and metallurgical tests will be made on the ores. Outcrops of red iron-ore seams were discovered in both areas many years ago, but only one attempt has been made to develop the Woodstock deposits which are estimated to have produced only 2,000 gross tons. Several mines have operated at various times in the Bucksville area and estimated production from this area is said to have been about 250,000 tons. Preliminary analyses place estimated recoverable reserves (assuming that 35 percent of the ore cannot be recovered) in both areas at more than 11,000,000 tons of commercial-grade ore, more than 7,000,000 tons of marginal ore, and 18,500,000 tons of ferruginous sandstone.

IRON RANGES

The huge taconite processing plant being erected by the *Reserve Mining Company* near Beaver Bay, Minnesota, has been named the "E. W. Davis Works" in honor of Professor E. W. Davis, longtime director of the Mines Experiment Station of the University of Minnesota, as official recognition of the many important contributions made by Professor Davis and the Mines Experiment Station to the development of the new taconite industry. By 1957, the plant will have an annual capacity of 3,750,000 tons of iron pellets made from taconite. Eventual capacity is planned for 10,000,000 tons of pellets per year. At Beaver Bay, construction has started on 300 more new homes and an 18-classroom school for use by the children of Reserve employes.

Three new mines recently started shipping concentrates on the Mesabi Ranges. In Coleraine, Minnesota, the *West Hill* mine of *Pickands Mather & Co.* has started shipping wash and heavy media concentrates. At Hibbing, the *East Morris* mine of *Oliver Iron Mining Division* of the *U.S. Steel Corporation*, and the *Boeing* mine of *Rhude and Fryberger* have both placed their crushing and screening plants in operation which has considerably increased the over-all shipments from that area.

The first iron ore has been mined from the newly opened *Loomis* open pit operated by *Pickands Mather & Co.* for the *Plymouth Mining Company* at Wakefield, Michigan. Ore was loaded into ore cars for eventual shipment to Ashland, Wisconsin. Stripping operations at Loomis started last fall. The new pit replaces the old *Plymouth* pit west of Wakefield.

The 36,058,371 gross tons of iron ore moved down the Great Lakes to July 1 of this season was the largest tonnage shipped for any like period in the history of Great Lakes shipping. The total for June was 13,744,984 gross tons which broke all June records and was the fourth highest for any month in history. The addition of larger and faster ore carriers has played a large part in establishing these new records.

"THIS LUBRICANT CUT OUR PARTS REPLACEMENT 50%"

—says THE NORTHERN PACIFIC TRANSPORT CO.

"The use of LUBRIPLATE in the worm-gear, hypoid and two speed axles has enabled us to change our oil-change period from 15,000 miles to 40,000 and sometimes more. Our overhaul periods are stretched from 50,000 to 100,000 miles and repair parts bill cut 50%!"

For nearest LUBRIPLATE distributor, see Classified Telephone Directory. Send for free 56-page "LUBRIPLATE DATA BOOK"... a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.

Cornucopia

(Continued from page 63)

will prove a world-beater when put in operation."

The district was a "steady and profitable" producer of gold and silver, especially after the completion of a cyanide plant at the Union-Companion mine in 1913, and the construction of a similar plant to treat ores from the Last Chance property. The mines were active between 1913 and 1918, "producing higher than average ore." They continued to be worked until late in 1926, when production decreased and operations were suspended.

All the way from Carson to Cornucopia, the "Cornucopia Granites" —commanding bare-topped mountains rising above forested slopes— loom bigger and bigger as one nears the quiet camp. Just at the edge of the town, rows of gray company houses, dating from 1936 and belonging to the Cornucopia Gold Mines Co., line the right side of the road. A curve to the left takes one across Pine Creek to a big mill and its accompanying buildings, but the original townsite is one-quarter of a mile away. To reach it, a less traveled road cuts through the trees parallel to Pine Creek and passes many frame buildings, half hidden by dense timber.

Some are built of chinked logs; some have porches; some have false-fronts; and nearly all have roofs made of shakes. The three-story, false-fronted Keller Hotel with its bar is the most imposing relic. Not far from it stands the barber shop and on the flat near the creek is the present schoolhouse and gymnasium built in 1938 and never used to capacity. Old foundations, smothered in weeds and shaded by huge pines, fill every vacant space along the streets between existing buildings. On the sagging porch of one old cabin stood an upright piano. Nearby, propped against a tree, close to the road, was the framed chromo portrait of a woman! The mines were so high above the town that tramways were needed to convey the ore from their portals to the mills far below. Today one mill and dumps and settling ponds mark the several properties.

At the far end of the main street stands a freshly painted two-story frame house surrounded by a well-tended garden—the home of Mr. Snyder, who came to Cornucopia when the town was still thriving. He pointed out the location of the first school (which was held in an old saloon "up against the hill"), as well as the site of the second school, a two-room frame house. The third schoolhouse is the gray structure situated on the flat.

He recalled the days when there were tents all the way up to the mountain and when prospectors were as thick as ants in an anthill. Besides the miners and the merchants, numbers of woodchoppers felled trees for mine timbers and for fuel. During the boom years, 1884 to 1886, nearly 750 people lived in the camp; the Union-Companion mine alone carried 90 men on its payroll.

Before I left, he spoke of the heavy snowfalls, normally 75 to 100 inches a winter, and he explained why so many cabins had ladders fastened to their roofs. Unless snow was shoveled off the roofs after a heavy fall, its added weight crushed them in. The ladders provided footing for the shovelers.

As I drove back to Halfway, beside Pine Creek, I looked again at the jumbled piles of boulders and the mounds of washed and sifted earth that survive from placer days. And I looked back at the Cornucopia Granite mountains believed by oldtimers to still contain "a veritable mass of gold." All that's needed to release it, they say, is capital.

DETACHABLE BITS
HOT MILLING

- We will hot mill, re-temper and harden the popular types and sizes of rock bits.
- We re-shank, re-thread, and re-condition any type, size, or length of Drill Steel.
- We manufacture and maintain a complete stock of new drill rods, gads, chisels, spades and all other tools used in Pneumatic Paving Breakers or Jack Hammers.

For Rent

Large and small portable air compressors, paving breakers, jack hammers, chipping hammers, pneumatic tools, and air hose.

We specialize in concrete cutting and demolition work.

EMSCO
AIR HOSE COUPLINGS

Dependable, Prompt Service

Phone or write
FOR PRICE SCHEDULES

Emsco Concrete Cutting Company

2751 East Eleventh Street • Los Angeles 23, California

AN 3-4151

U. S. Personals

(*Continued from page 64*)

metallurgist at the Erie Laboratory in Hibbing, Minnesota.

John A. Marsh has been elected vice president of the International Nickel Company, Incorporated. He will be in charge of all plant operations in the United States.

Arthur Pascoe is working on the Mather "B" shaft of the Cleveland-Cliffs Iron Company at Negaunee, Michigan. Formerly he was mechanical foreman at the Spies iron mine.

John Simmons, metallurgist, has joined Zontelli Brothers, Inc. and is working at the firm's low-grade iron ore concentration plant at Ironwood, Michigan.

Clarence F. Rippl, engineer, has been transferred by Pickands Mather & Co. to Rabbitt Lake iron mine in Cuyuna, Minnesota from his position at the Mahoning iron mine in Hibbing, Minnesota.

James B. Hustad is working as a geologist in the raw material department of the United States Steel Corporation in Pittsburgh, Pennsylvania.

Fred Vines has been appointed chief engineer for the M. A. Hanna Company. His headquarters will be at the Hanna general offices in Cleveland, Ohio. **Robert S. Walker**, whom Mr. Vines succeeds, has been made consulting engineer.

J. B. Austin, director of research laboratories for the United States Steel Corporation at Kearny, New Jersey has been elected president of the American Society for Metals. Other officers include: **George A. Roberts**, chief metallurgist for Vanadium Alloys Steel Corporation at Latrobe, Pennsylvania, vice president; **W. A. Pennington** of the Carrier Corporation of Syracuse, New York, treasurer; **G. M. Young** of the Aluminum Company of Canada, Ltd. of Montreal, Quebec, and **Robert Raudebaugh** of the Georgia Institute of Technology in Atlanta, Georgia, trustees.

J. Fred Johnson, former manager of western mines for the American Smelting and Refining Company who retired on January 1, recently returned from a mine examination trip to Peru. He left immediately for the Philippine Islands where he will check mining practices there with particular emphasis on rock drilling problems.

Howard I. Young, president of the American Zinc Lead and Smelting Company, has returned to his St. Louis headquarters after a 10-week European business and pleasure trip. He visited England, Scotland, France, Belgium, Spain, and Western Germany on his trip.

Bert C. Austin who has served as director of the Idaho-Maryland Mines Corporation which has its headquarters in San Francisco and its mines in Grass Valley, California, has been elected president and general manager of the firm. He succeeds **Albert Crase** of Grass Valley who has resigned. **Max Bechhold** has been re-named vice president and assistant to the general manager. **Henry J. Nelson** of Hooker & Fay, San Francisco investment firm, was elected a director of Idaho-Maryland.

Howard P. Ellis, president of Basic Refractories Incorporated at Cleveland, Ohio, was awarded an honorary degree by the University of Nevada for his work in founding Basic Magnesium, Inc., at Henderson, Nevada. The plant at Henderson, one of the largest war-time factories in the United States, was built to process magnesium carbonate into metallic magnesium.

Harold E. Worcester was elected president of the San Juan sub-section, of the American Institute of Mining Engineers in Colorado. Mr. Worcester is a uranium mine operator from Montrose. **Henry R. Wardwell**, mining geologist with the U. S. Atomic Energy Commission at Grand Junction, was elected vice-chairman, and **James Lake**, a uranium metallurgist, also of Grand Junction, was elected secretary.

Franz Schneider has been named as a Class C director of the Federal Reserve Bank of New York for the term ending December 31, 1955. Mr. Schneider is executive vice president of the Newmont Mining Corporation of New York. He succeeds **Philip Young**, former dean of the Columbia University Graduate School of Business who resigned to accept appointment as chairman of the U. S. Civil Service Commission.

T. W. Newell will supervise the opening up of a proven uranium deposit near Uravan, Colorado where a shaft will be sunk by the Shattuck Denn Mining Corporation.

BUNKER HILL & SULLIVAN
MINING AND CONCENTRATING CO.
Mines and Smelter at Kellogg, Idaho

Buyers of:

Lead ores and concentrates, zinc concentrates, silicious gold ores.

Sellers of:

"BUNKER HILL" brand of refined Pig Lead, Slab Zinc, Cadmium crude Antimonial Lead and Leaded Zinc Oxide.

We are proud of our "BUNKER HILL" trade mark. It represents the highest quality of metals produced. We likewise strive to make "BUNKER HILL" known as a symbol of the highest quality in our relations with our employees, with our suppliers of ores and concentrates, with our stockholders and with the general public.

For information regarding ore rates and shipments Address:

BUNKER HILL SMELTER
Box 29
Kellogg, Idaho

MAGMA
COPPER COMPANY

Buyers of

COPPER, GOLD

AND SILVER ORES

MINES AND SMELTER AT

SUPERIOR, ARIZONA

PROFESSIONAL DIRECTORY

One-Inch Card, $50 Yearly—½-Inch, $30 Yearly. Payable in Advance.

CONSULTING ENGINEERS:

Cables: KELLCON Sterling 1079

JOHN E. KELLY

Consultant in Natural Resources
Washington Representation
Minerals Petroleum Timber Power Water
316 Southern Building Washington 5, D.C.

Aerogeological Exploration
Color Aerial Photography
Exploration Projects

PHILIP A. LAYLANDER

Geologist
Box 241 Fallon, Nevada

ARNOLD H. MILLER
CONSULTING ENGINEER

General Mine, Mill and Industrial Appraisals, Plant Design, Mechanization.
Cable: "ALMIL" Tel. Cortland 7-0635
120 Broadway New York City 5, N. Y.

MURPHY, F. M.
Consulting Mining Geologist
1201 Maryland Parkway, Las Vegas, Nev.

RODGERS PEALE
Consulting Mining Geologist
315 Montgomery St. San Francisco 4, Calif.

FRANKLIN L. C. PRICE
Registered Mining Engineer
Examinations—Valuations
1105 Northern Life Tower—Tel. MAin 5134
Seattle 1, Wash.

ARTHUR R. STILL

Consulting Mining Geologist
Exploration Planning—Property Examinations
Engineering and Geologic Mapping
Small Mine Management
Box 1512 Prescott, Arizona

MILL DESIGN & CONSTRUCTION
Send for Free Bulletin
O. W. WALVOORD CO.
401 High Street • Denver, Colorado

CLIFFORD R. WILFLEY
Mining Engineer
Consulting
2233 Grape St. EAst 0398
Denver 7, Colorado

CLYDE H. WILSON
GEOLOGICAL AND GEOPHYSICAL SURVEYS
Mineral Deposits • Water Supply
Oil Field Structure

WILSON EXPLORATION COMPANY
Los Angeles Salt Lake City
1727 Westerly Terrace Walker Bank Building

CHEMISTS, SAMPLERS, SHIPPERS' REP'S:

ARIZ. TESTING LABORATORIES
CLAUDE E. McLEAN, REGISTERED ASSAYER
Analytical and Consulting Chemists
Box 1888 817 W. Madison St. Phoenix

SHIPPERS' REPRESENTATIVES
at Tacoma Smelter for over 35 years
Control and Umpire Assaying
BENNETTS
Chemical Laboratory, Inc.
901 So. 9th Street • Tacoma 3, Wash.

B. W. DEASON V. E. WORSLEY
BLACK & DEASON
Assayers and Chemists
Ore Shippers Represented at all Smelters
P. O. Box #1888 Salt Lake City, Utah

THE COLORADO ASSAYING CO.
ASSAYERS, CHEMISTS, and
SPECTROGRAPHERS
Est. 1900
Gold, Silver each $1, both $1.50, Copper 75c. Send for Free Copy of Our Mineralogist's Pocket Reference Giving Detailed Information on All the Principal Ores.
2013 WELTON ST., DENVER 1, COLORADO

CUSTOM ASSAY OFFICE and LABORATORY
Commercial and Umpire Assayers
All types of organic and inorganic chemical analysis
Shippers Representatives
105 South Santa Fe, El Paso, Texas
Post Office Box 811 Phone 2-2212

DICKINSON LABORATORIES
Assayers—Chemists—Metallurgists—Umpires
Shippers Representatives at Local Smelters
Representatives at Mexican Border
Points for Shippers of Manganese and Fluorspar
1300 West Main Street El Paso, Texas

GOODALL BROTHERS
ASSAYERS AND CHEMISTS
SHIPPERS' REPRESENTATIVES
Established 1909
Helena Montana

HANKS, INC., ABBOT A.
ASSAYERS AND CHEMISTS
Supervision of Sampling at Smelters
Spectrographic Analysis
624 Sacramento St. San Francisco 11

HAWLEY & HAWLEY
W. E. HAWLEY, Mgr
Assayers, Chemists, Ore Buyers
Shippers' Representative
P. O. Box 1060 Douglas, Arizona

LEDOUX & CO. (INC.)
Assayers Spectrographers Chemists
Shippers representatives at all seaports and refineries in the United States
359 Alfred Avenue Teaneck, N.J.

NEW WORLD EXPLORATION RESEARCH & DEVELOPMENT CORP.
Foreign & Domestic Consultants
Geology Geophysics
Mine Management
Contract Diamond Drilling
Box 1206 Reno, Nevada

SMITH-EMERY COMPANY
Established 1910
Assayers—Chemists
Metallurgists
Spectrographers
Shippers' Representatives
920 Santee Street Los Angeles, Calif.
Member
American Council of Commercial Laboratories

Wood Assaying Co., Henry E.
Established 1878
ASSAYERS and CHEMISTS
2042 Broadway Denver 2, Colorado

DRILLING COMPANIES:

DIAMOND DRILL
Contracting Company
S. 18 Stone Spokane 15, Wash.
"DIA-HARD" CORE
BARRELS
AND
DIAMOND DRILLING SUPPLIES
Core and Churn Drill Contractors

R. S. McClintock
Diamond Drill Company
Spokane, Washington—Globe, Arizona
Diamond Core Drill Contractors
Manufacturer of Diamond Bits
and drilling accessories

PRODUCTS AND SUPPLIES:

VAN WATERS & ROGERS INC.
Flotation Chemicals, Mining Reagents
Largest and Most Complete Stocks in Northwest
Seattle, Spokane, Portland, Boise

U. S. Personals

Hal E. Brown will serve as assistant chief mining engineer for the Hibbing-Nashwauk district operations of the Oliver Iron Mining Division of U. S. Steel Corporation on the Mesabi Iron Range of Minnesota.

John W. W. Sullivan will succeed Charles M. Parker as metallurgical engineer of the American Iron and Steel Institute of New York. Mr. Parker will become assistant vice president of the Institute, in charge of its technical division. Mr. Sullivan, who became a member of the Institute staff in 1945, was graduated from the Massachusetts Institute of Technology.

Neil L. Hanson, metallurgist, is now employed with Rhude and Fryberger Company, iron mining and contracting firm of Hibbing, Minnesota.

Joel Hunter, former vice-president in charge of finance of the Crucible Steel Company, has been elected a director and executive vice-president.

E. L. Beutner of Ishpeming, Michigan, has been promoted to the position of assistant chief geologist for the Michigan Ore Division of the Jones & Laughlin Steel Corporation. His former position as resident geologist for the firm has been taken by G. A. Hoffman, formerly a mine geologist at the Tracy iron mine in Negaunee, Michigan.

J. H. Hayner will serve as division manager for Kaiser Engineering Atomic Energy Division, and P. D. Bush will be assistant division manager. George Havas, vice-president and general manager at Kaiser, has announced that his firm will partake in the atomic energy engineering and development necessary to benefit United States industry. Mr. Hayner has been assistant plant manager for the Oak Ridge plant, chief of the research division for establishment of the Brookhaven National Laboratory, and chief chemical engineer for the division of engineering, U. S. Atomic Energy Commission, in Washington, D. C. He has recently returned from a study in Brazil to investigate possibilities of an atomic energy program there.

James E. Phebus has been appointed general superintendent of mine and plant operations of the St. Louis Smelting and Refining Division of the National Lead Company at Fredericktown, Missouri. Mr. Phebus was graduated from the Colorado School of Mines in 1942, and was first employed by National Lead in 1946 where he was engineer and then chief engineer. In 1951 he took a position as acting director, program development division, of the Defense Minerals Procurement Agency.

Harrison S. Cobb, prominent Boulder County, Colorado tungsten miner and president of the Colorado Mining Association, has been in western Montana checking hubnerite deposits.

DR. TRUMAN H. KUHN has been appointed dean of the graduate division of the Colorado School of Mines in Golden, Colorado. He succeeds PROFESSOR CLARK B. CARPENTER who has retired from the faculty. Dr. Kuhn has been a member of the faculty since 1942. He was graduated from the California Institute of Technology with a B.S. degree, attended graduate school at the University of California, and received his Ph.D. from the University of Arizona. He has served as a geologist for the Arizona Molybdenum Corporation, the Magma Copper Company, and the Eagle-Picher Company. He has been a mining geology consultant since 1942, and has worked for the United States Geological Survey.

Ted Evans, mining engineer, has taken a position as mining superintendent for the Foote Mineral Company of Sunbright, Virginia. Mr. Evans, a graduate of McGill University, has been employed as a mining supervisor for the National Gypsum Company and as a service engineer for Hercules Powder Company.

THE MARKET PLACE

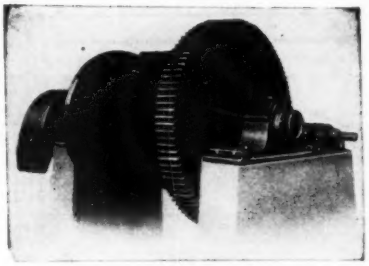
SELECT YOUR EQUIPMENT NEEDS FROM THE LARGE STOCK OF DEPENDABLE RECONDITIONED MACHINERY.

LOCOMOTIVES
1—2-2½ ton Whitcomb Battery, 24" gauge
1—2½ ton Jeffrey battery or trolley, 36" gauge
1—3½ ton Mancha battery, 24" gauge, with 2 sets Edison batteries and charging set
1—4 ton Ironton battery, 36" gauge
2—7 ton General Electric permissible battery, 36" gauge
1—7 ton Atlas battery, 36" gauge
3—8 ton Ironton battery, 36" gauge
2—8 ton General Electric battery, 36" gauge
4—10 ton Atlas battery, 36" gauge
1—3 ton Whitcomb gas engine driven, 24" gauge
1—4½ ton Goodman trolley, 36" gauge
1—5 ton Jeffrey trolley, 36" gauge
1—6 ton Goodman trolley, 36" gauge
2—8 ton Goodman trolley, 36" gauge

FLOTATION MACHINES
1—New Morse "Jetair" 6 cell #30
1—New Morse Jetair #7 Hydra-cell
1—New Morse Jetair 2 cell #7
1—Fagregan Single cell
1—6 cell 18" Stearns-Roger
1—6 cell Denver "Sub A" #18
1—6 cell Denver "Sub A" #21

FILTERS
1—6' 2-disc American Filter
1—6' 3-disc American Filter
1—18" Morse Round Pattern Filter Press
1—36" Merrill Triangular Filter Press
1—12# Sweetland Filter Press, 36 leaves

BALL & ROD MILLS
1—4' x 4' Colo. Iron Works Ball Mill
2—6' x 48" Hardinge Conical Ball Mills with air swept equipment
1—8' x 22" Hardinge Conical Pebble Mill
1—9' x 8' Marcy Rod Mill



CLASSIFIERS
1—48" x 15' Dorr Multizone Classifier
1—48" x 18' Akins Spiral Classifier

THICKENERS
1—24' dia. Dorr Lowhead Thickener Mechanism and Superstructure

COMPRESSORS
1—64 CFM Gardner-Denver, 4½" x 4"
2—88 CFM Ingersoll-Rand, 7" x 5"
1—121 CFM Gardner-Denver, 8" x 6"
1—173 CFM Chicago-Pneumatic, 9" x 8"
1—173 CFM Ingersoll-Rand, 9" x 8"
1—179 CFM Ingersoll-Rand, 12" x 10"
1—213 CFM Blaisdell, 14" & 9" x 8"
1—230 CFM Gardner-Denver, 6" & 4¾" x 5"
1—447 CFM Ingersoll-Rand, 14" & 7½"x12"
1—637 CFM Sullivan, 14" & 8¾" x 10"
1—698 CFM Union, 16" x 12"
1—800 CFM Ingersoll-Rand 18" & 11" x 16"
1—840 CFM Laidlaw, 13" x 10"
1—1418 CFM Ingersoll-Rand, 24" & 13"x16"
1—105 CFM Ingersoll-Rand driven by 1-ea. 4 cyl. gas engine

CONCENTRATING TABLES
4—#6 Wilfley Tables with Steel Underframe
2—Deister "Plat-O" Tables with Steel Underframe
2—Deister "Plat-O" Tables for Concrete Setting

MOTOR GENERATOR SETS
1—2-¼ KW Western Electric, 250 V DC—440 V AC
1—5 KW Crocker-Wheeler, 250 V DC—440 V AC
1—22 KW Westinghouse, 125 V DC——440 V AC
1—40 KW Imperial, 250 V DC—440 V AC
1—40 KW Milwaukee, 250 V DC—440 V AC
1—75 KW Ridgeway, 125 V DC—2200 V AC
1—165 KW General Electric, 600 V DC—440

WAGON DRILLS
1—Ingersoll-Rand Model FM-2 Wagon Drill on Three Pneumatic Tires with Type X71WD Drifter

CRUSHERS
4—2-¼" x 3-½" New Morse Lab Jaw Crushers
5—4" x 6" New Morse Lab Jaw Crushers
2—9" x 14" Universal Jaw Crushers
1—9" x 15" Wheeling Jaw Crusher
1—9" x 15" Farrell Jaw Crusher
1—9" x 16" Universal Jaw Crusher
1—8" x 24" Rogers Jaw Crusher
1—8" x 36" Universal Jaw Crusher
1—11" x 18" Universal Jaw Crusher
1—24" x 13" Farrell Jaw Crusher
1—10" x 16" Hercules Jaw Crusher
1—36" x 48" Jeffrey Flextooth Crusher
1—26" x 18" Williams Hammermill
1—30" x 17" Williams Hammermill

Serving the World's Mining Regions since 1898.

MORSE BROS. MACHINERY COMPANY

2900 Brighton Blvd. **Denver 1, Colorado**

28 SURPLUS NEW BELT CONVEYORS
24 INCH 1-1100' long.
36 INCH 1-160' – 2-250' – 1-320' – 1-400' 1-590' – 2-1000' & 1-1600' long.
42 INCH 1-144' – 1-290' – 1-377' – 1-575' 2-700' – 1-800' & 2-1500' long.
60 INCH 1-100' & 1-500' long.

NEW MERRICK WEIGHTOMETERS
7 Type E for 24", 30", 36" & 42" Belt.

SYNC. MOTOR GENERATORS
2 – 500 KW WESTGH 1200 rpm 4160/2300 – 275 V
3 – 150 KW G.E. 1200 rpm 2300 – 275 V
1 – 100 KW RIDGEWAY 1200 rpm 2300 – 275 V

TUNNEL SHOVEL LOADERS
13 Eimco 12B – 21 – 21.55 – 40 – 102
4 Gardner Denver GD9 – 14

DIAMOND DRILLS
3 Sullivan 500 ft. & 1500 ft. ROD CAP.

ELEC. MINE HOISTS
25 Single Drum 60 H.P. & 100 H.P.
150 H.P., 260 H.P., 600 H.P. & 1300 H.P.
19 Double Drum 75 H.P. & 125 H.P.
150 H.P., 400 H.P. & 500 H.P.
9 Cylindro Conical 100 H.P., 350 H.P., 800 H.P., 1000 H.P. & 1400 H.P.

69 MINE CARS
89 cu. ft. cap. Sanford Ray 36 inch gauge, drop bottom.

ELEC. AIR COMPRESSORS
1888 ft. Chgo. Pneu. 350 H.P., 2200 V
3000 ft. Chgo. Pneu. 500 H.P., 2200 V
676 ft. Worthgtn 125 H.P. 220/440 V

LOCOMOTIVES
45 ton G.E. Diesel Elec.
20 ton Whitcomb Gas
5 ton Plymouth Gasoline
6 ton Brookville Diesel
4 — to 6 ton Jeffrey Battery
9 — 4 ton, 6 ton, 8 ton Goodman Trolley

CRUSHERS
2 Buchanan C Sectional 30 x 42.
14 Jaw 18x36 – 24x36 – 10x36 – 42x48 and 48x60
1 Model 322R Allis Chalmers Reduction
1 Traylor 3 ft. TY Reduction

BELT CONVEYOR IDLERS
3075 New 36 in. 42 in., 60 in. Troughing and Return Type.

TUBE, ROD & BALL MILLS
Hardinge Conical Mills 5'x22", 6'x22", 6'x36", 8'x30", 10'x36" & 10'x48"
2 – 5'x18" Tube Mills. Manz. steel lined.
Rod Mills 3'x10', 4'x7" & 5'x14'
Cylindrical Ball Mills 3'x7', 4'x5', 5'x8', 6'x6', 6'x10', 7'x6' & 8'x6'

CLASSIFIERS & THICKENERS
Dorr 3'x25'x10 Turret Bowl
Dorr 6'x22' DSF Rake & 2'x15' SSFR
Atkins 60" High Weir Classifier
Dorr 40'D.x30' — Three Tray 4 Comp. Thickener
Hardinge 6'x14' Counter Current Classifier

SPECIALS
8½' – 10' – 8½' x 50" Nodulizing Kiln
Dings 3-Roll 60" Type IR Mag. Sep.
Manganese Sulphate Recovery System.

DARIEN CORP.
60 E. 42nd St., New York 17, N.Y.

GOLD AND SILVER INDICATORS

Detect for half mile. Guaranteed to work only on gold and silver, or money refunded. Price $30.

For information write
Box 2 Brockton 69, Mass.

MINING WORLD
with which is combined
MINING JOURNAL
The Production Magazine of the Metal Mining Industry
Published at
SAN FRANCISCO, CALIFORNIA
$3.00 Per Year ..... 13 Issues
(Includes Mine Development and Directory Number)

ALLISON STEEL MANUFACTURING COMPANY

Mine and Mill Buildings • Mine Rails • Ore Cars • Steel Gallows Frames • Ball Mills • Muck Plates • Crucible Drill Steel

We offer a complete repair service to the Mining Industry. Our new Machine Shop is equipped to handle your work quickly and economically.

Hot Milling of All Types of Detachable Bits

SOUTH 19TH AVENUE
PHOENIX ARIZONA
PHONE ALpine 8-7731

POSITIONS OPEN

CHF. MECH. ENGR., mine, fgn.	$15,000
ASST. CHF. mech. engr. mine, fgn.	$700
ASST. R. R. Supt., fgn.	$833
PHYSICIAN-surgeon, mine, U.S.	$12,000
MINE FOREMAN, fgn.	$435
MINE ENGRS., expd. U. S. (2)	$450
JR. MINE ENGRS., fgn. & U.S.	$325-$405
GEOLOGIST, mining	to $500
MILL FOREMAN, fgn.	$425
MILL SUPTS. (2) flot. U.S.	$500
METALLURGIST, flot., fgn.	$800
METALLURGIST, shift f'man	$350
METALLURGISTS (3) metal fab.	to $430
MILL OPRS., flot., table	$428
ASST. SMELTER F'man, fgn.	$450
REVERB. & Converter f'man, fgn.	$500
MECH'L SUPT., steel mill	$600
ASST. MASTER Mech., fgn.	$550
CHEM. ENGR., indust'l rubber	$800
CHEM. ENGRS., production	$325-$350
CHEMIST, analysis, fgn.	$600
DIAM. DRILL F'man, fgn.	OPEN
JR. TEST ENGR., power plant	$421
MACHINE DESIGN, Denver	$500
MILL & STRUCT. draftsman, Denver	OPEN
MECH. draftsman, Colo.	$400
E. E. GRAD., power, U.S.	$375
MECH. chem. mine engrg grads	$325-$400
CIVIL ENGR., R.R. exp., fgn.	$500
CIVIL ENGR., construc'n, fgn.	$650
WAREHOUSEMAN, spk Span., fgn.	$450
COST ACCT., industrial, Colo.	$6,500
COST ACCT., mfg plant, Indiana	$6,600
STENOGRAPHER, mining co., Colo.	OPEN

GLENN B. WILSON
EMPLOYMENT SPECIALISTS
306 CONTINENTAL OIL BUILDING
Denver 2, Colorado

LOCOMOTIVE, DIESEL ELECTRIC 45 ton, 0-4-4-0. Sale or rent.
COMPRESSOR: Chicago Pneumatic C.C.E. 26"x15"x18", synchronous motor 400 H.P. 2300 volt, capacity 2200 C.F.M.
JAW CRUSHERS: Sizes 12"x16" to 48"x60".
CLASSIFIERS: 6—Akins and Wemco 30' x34' and 78"x28½ ft., Simplex, single screw, weir type, with synchronous gear motor, 220/440 volt, with lifting device. Condition like NEW, available now, three located Nevada.
LOCOMOTIVE CRANE: Link Belt 25 ton capacity, standard R.R. gauge, gasoline powered, cast steel trucks, air brakes with or without 1¼ yd. Williams clam shell bucket, thoroughly modern, excellent condition, located Minnesota.
DIESEL MOTOR: Caterpillar D13000 portable on skids, 122 H.P.
BLOWERS: 2—36", capacity 39500 C.F.M. @ 14.7 lbs., 500 H.P. motor, 3 phase 60 cycle, 2300 volt.
CLAM SHELL BUCKET: Blaw Knox size 7250, 2½ yd. capacity, NEW condition.
SINGLE DRUM HOISTS:
100 H.P., 1⅛" rope, 5' dia., 5' face.
200 H.P., 1⅛" rope, 5' dia., 7' face.
200 H.P., 1" rope, 5' dia., 5' face.
225 H.P., 1⅛" rope, 4'6" dia., 4' face.
300 H.P., 1¼" rope, 5'6" dia., 4' face.
350 H.P., 1⅛" rope, 7' dia., 6' face.
400 H.P., 1⅛" rope, 7' dia., 7' face.
800 H.P., 1⅛" rope, 7' dia., 5' face.
900 H.P., 1⅜" rope, 10' dia., 6'3" face.
DOUBLE DRUM HOISTS:
100 H.P., ¾" rope, 3' dia., 2' face clutched.
300 H.P., 1⅛" rope, 6' dia., 4' face clutched.
350 H.P., 1⅛" rope, 6' dia., 6' face clutched.
500 H.P., 1⅛" rope, 8' dia., 5' face clutched.
600 H.P., 1½" rope, Conical, 1200 ft.
900 H.P., 1⅞" rope, 14' dia., 7' face clutched.
1200 H.P., 1¾" rope, 9' dia., 6' face clutched.
2700 H.P., 1⅞" rope, 12' dia., 7' face clutched.
All above Hoists complete with motors and controls. Drawings and photos available. WE BUY AND SELL EQUIPMENT THROUGHOUT NORTH AND CENTRAL AMERICA.
A. J. O'NEIL, Lansdowne, Pa.
Phila. Phones: MAdison 3-8300 — 3-8301

MACHINERY
Motor: 150 hp Wstnghse Ty. CW 220/4 rpm slipring, with controller, grids and contactor panel.
Compressor: 1721 cfpm I-R PRE2 with Synchronous motor, etc.
Compressors: 2 I-R 877 cfpm Type XR8 with hp motors.
Mill: Marcy 5 ft. dia. x 10 ft. with slipring motor, etc.
Sand Pumps: 2 to 4" Wilfleys.
Magnetic Pulley: 18x18 Stearns complete with m.g. set, etc.

PAUL F. SMITH
39 W. Adams St. Phoenix, Arizona

Mercury Mine Machinery For Sale

Complete, all in excellent condition nearly new 25 ton Hershoff Retort, 40 K W Buda Diesel Generating Plant, Worthington 160 Compressor, 10 H P Electric Hoist, 7½ H P Sullivan Tugger, 6x12 Jaw Crusher, 18 inch Conveyor System, 4 Card Cars, Rail, Pipe, Tools, Etc.

Original Cost $50,000 Sale Price $12,000

Complete Itemized List Upon Request

Call or write A. R. Erspamer
2010 So. Tacoma Way Tacoma, Wash.
Phone Hathorne 2611

THE MARKET PLACE

BARGAINS

Modern Mine Buildings and Equipment Located in Northern New York

3—Mill Buildings . . . Primary, Secondary, Concentrate, and all connecting Galleries. Blue Prints available.
1—16" Superior McCulley Crusher with complete set of spare parts. Like new.
2—8 V.G. Dust Collectors and Equipment complete.
1—42" x 42" Magnetic Cobber (Dings).
2—20" x 10' S. Peidometers.
1—12' x 6' Oliver Filter complete with spare parts.
1—8D Rotary Vacuum Pump.
2—Geery Jenings Ore Samplers.
1—Railroad Type Motor Car.
1—Bucket Elevator complete with spare belt and parts.
6—Hummer Screens complete with spare parts.
1—Air Conditioning Unit.
1—2263 Gal. Fresh Water Tank.
2—Synchronous Converters.
1—Ingersoll Rand Bit Quenching Machine.
1—Ingersoll Rand J.M.B. Jackmill, complete.
1—Ingersoll Rand "J.F." Jack Furnace.
1—Ingersoll Rand Automatic Bit Grinder—Direct Motor Driven with many new grinding wheels.
6—Ingersoll Rand Jack Hammers.
2—Ingersoll Rand Busters.
2—Ingersoll Rand Drifters.
2—Worthington Air Pumps.
1—500 Amp. Westinghouse A.C. Welder.
150—Mine Dry Baskets Complete with Accessories.
1250—New 5" Steel Balls for Ball Mill.
4—103" Dia. Head Frame Pulleys, complete with bearings.

We also have a large assortment of gear reducers, electric hoists, water pumps, compressors, new and rebuilt electric motors of all voltages and hundreds of other items.

RUDERMAN MACHINERY EXCHANGE
GOUVERNEUR, NEW YORK
Telephone 333-334

PRICED TO MOVE — ALL REBUILT

LOCOMOTIVES

1—8-ton Whitcomb 24" gauge Diesel Locomotive, practically new, price $4800.00

1—6-ton 24" gauge, rebuilt Whitcomb Gasoline Locomotive, price $2850.00

3—Jeffrey 24" gauge 6-ton Trolley Locomotives, 250 V DC, price $3500.00 each

2—6-ton Westinghouse 24" gauge Trolley Locomotives, 250 V DC, price $3250.00 each

Several 8-, 10-, 13-, and 15-ton 250 V DC Trolley-type Locomotives, 26" to 42" gauge, all rebuilt and guaranteed. Offered at low prices. Track gauge on any of the above can be changed to meet your requirements.

MOTOR GENERATORS AND ROTARY CONVERTERS

1—500 KW Westinghouse Syn. M.G. Set, 1200 RPM, 250/275 V DC, .8 P.F., 3 phase, 60 cy., 2300/4000 V AC, complete with switchboards and FULL AUTOMATIC AC and DC switchgear. Late type, completely rebuilt, price only $12,500.00

2—200 KW G.E. Syn. M.G. Sets, 250/275 V DC, 1200 speed, 3 ph., 60 cy., 2300/4000 V AC, switchboards, FULL AUTOMATIC AC and DC switchgear, price $7250.00 each

3—200 KW G.E. Syn. Rotary Converters, Type HCC-6, Form P, 1200 RPM, 250/275 V DC, complete with switchboards, switchgear, and three single phase, 2070/2300 V transformers, price $4500.00 each.

2—300 KW G.E. Mercury Arc Rectifiers, 250/275 V DC, 2300 V AC, on portable trucks, FULL AUTOMATIC equipment, only $25,000.00 each

All of the above equipment is rebuilt and guaranteed.

LOADING MACHINES

10—8-BU-3-E Joy Loading Machines, 250 V DC, rebuilt, practically new condition, price only $3500.00 each

SINGLE AND DOUBLE DRUM HOISTS

Have large selection of Single and Double Drum Slope or Shaft Hoists with motors from 150 to 1200 HP—all offered at very attractive prices. Send us your inquiries for any Hoists you may need.

COAL MINE EQUIPMENT SALES COMPANY

FRANK J. WOLFE — SHELDON J. WOLFE
306-307 BEASLEY BUILDING • PHONE LONG DISTANCE 34 • TERRE HAUTE, INDIANA

BUSINESS MEN'S CLEARING HOUSE

601 MIDLAND SAVINGS BUILDING
DENVER, COLORADO

50 years of world-wide placement service for all classes of executive, engineering, operating, etc., mine and mill men

FILE YOUR APPLICATION WITH US

FOR SALE
By Mining Company

4—9 cu. yd. Mack Dump Trucks, Model FH1938
2—15 cu. yd. Mack Dump Trucks, Model LPSW, Thermodyne with Bogie Drive
1—8' x 24' Dorr Classifier, Model DSF
1—4' x 30' x 15' Dorr Bowl Classifier
1—3' x 23'4" x 15' Dorr Bowl Classifier
1—42" x 60" Marcy Pebble Mill, Serial #630
2—14' x 18' Oliver Filters
1—21x10 C P Vacuum Pump, Model O1D8
2—20" x 90' centers Belt Conveyors, complete with mechanisms
1—20" x 180' centers Belt Conveyor, complete with mechanism
3—12' x 12' Steel Tanks, with 38" Devereaux agitator mechanisms
1—10' x 8' Redwood Lo-head thickener tank
1—12' x 8' steel WEMCO Lo-head thickener tank
1—20' x 6' x 7' filter leaf tank—60 leaf capacity
3—60' x 12' Steel sand tanks
4—60' x 10' Steel thickener tanks, complete with WEMCO mechanisms
1—50 HP Scotch dryback boiler, with oil burner
3—12' x 12' steel agitator tanks, with 38" Devereaux mechanisms
5—Kimball-Krogh sand pumps, complete with motors and switches
2—24' x 14' Agitator tanks, 48" Devereaux agitator mechanisms

MINING WORLD, Box H-1, 121 Second St., San Francisco 5, Calif.

FOR SALE IN COLOMBIA, SOUTH AMERICA

Placer Gold, Bucket line dredge, all steel, modern design, full electric operated. Ward Leonard control. 12½ Cu. Ft. high speed bucket line. Digging depth 35 feet below water. Capacity 5,000,000 to 6,000,000 Cu. Yds. per year. Complete jig equipment. Spare parts, shops and dismantling equipment available. Located on main railway line 225 Kilometers from Pacific port of Buenaventura, 30 miles south of Cali, Department of Cauca, Colombia, South America. It is anticipated that this dredge will be available at about the end of October. Meanwhile it may be inspected at any time. Offers for the same "as is and where is" are solicited and should be submitted not later than October 1st, 1953. The highest or any offer not necessarily accepted.

Address inquiries to: Consolidated Purchasing and Designing, Incorporated, 2300 Russ Building, San Francisco 4, California.

FEDERAL PIPE & TANK CO.
—WOOD PIPE and WOOD TANKS—
Factory and Main Office
6851 E. Marginal Way
Seattle 8, Wash.

Market Place Advertising

360 inches	$5.50
180 inches	$6.00
90 inches	$6.50
45 inches	$7.00
Less than 45 inches	$7.50

Contract rates based on local number of column inches used within one year.
30 column inches equal one page.
Closing date: 1st of month preceding publication.
(Used and reconditioned equipment, liquidations, property sales only)
For additional 10,000 WORLD MINING export distribution: Add 50%

WANTED IMMEDIATELY

Underground Sinking Hoist, 150-200 HP 2-drum sectionalized, to go down 5' x 5' vertical shaft. Give us description of any hoist you have for sale.

MACHINERY CENTER, INC.
(Formerly Roger Pierce Equip. Sales Co.)
808 Newhouse Bldg. Salt Lake City, Utah

INDEX OF ADVERTISERS

Agence Miniere et Maritime 90
Allen-Sherman-Hoff Pump Co. Inside Front Cover
Allis-Chalmers Mfg. Co. General Machinery Div. W M 18, 19, 31 (World Mining)
Allis-Chalmers Mfg. Co. Tractor Div. 27
Allison Steel Mfg. Co. 118
Alloy Steel & Metals Co. 6
American Cyanamid Co. 38
American Manganese Steel Div. American Brake Shoe Co. 16
American Mine Door Co. 87
American Smelting & Refining Co. 108
American Zinc, Lead & Smelting Co. 105
Anaconda Wire & Cable Co. 25
Arizona Testing Laboratories 116
Atlas Powder Co. 100

Baldwin-Lima-Hamilton Corp. 10
Barber-Greene Co. 95
Bemis Bro. Bag Co. 88
Bennett's Chemical Laboratory 116
Black & Deason 116
Bodinson Mfg. Co. 87
Boyles Bros. Drilling Co. 109
Boyles Bros. Drilling Co., Ltd. 70 (World Mining)
Bunker Hill & Sullivan Mining & Concentrating Co. 115
Business Men's Clearing House 119

Card Iron Works, C. S. 86
Caterpillar Tractor Co. 1, 36, 40
Chain Belt Co. W M 17 (World Mining)
Coal Mine Equipment Sales 119
Coast Mfg. Co. 112
Colorado Assaying Co. 116
Colorado Fuel & Iron Corp. 28, 29
Colorado Iron Works 84
Columbian Steel Tank Co. 99
Consolidated Pneumatic Tool Co. W M 22 (World Mining)
Consolidated Purchasing & Designing, Inc. 119
Cooper-Bessemer Corp. 13
Custom Assay Office 116

Darien Corp. 118
Deister Concentrator Co. 88
Denver Equipment Co. 92
Detroit Deisel Engine Div. General Motors Corp. 21
Diamond Drill Contracting Co. 116
Dickinson Laboratories 116
Differential Steel Car Co. 103
Dorr Co. 12
Dow Chemical Co. 56
Du Pont de Nemours & Co., Inc., E. I. 20

Eimco Corp. 94 Outside Front Cover
Emsco Concrete Cutting Co. 114
Engineers Syndicate, Inc. 95
Erspamer, A. R. 118
Euclid Road Machinery Co. 79

Federal Pipe & Tank Co. 119

Galigher Co. 2
Gardner-Denver Co. 91
General Electric Co., International Inside Front Cover (World Mining)
Goodall Brothers 116
Greensburg Machine Co. 86 (World Mining)

Hanks, Inc., Abbott A. 116
Hardinge Co. 83
Harnischfeger Corp. 77
Hawley & Hawley 116
Heil Co. W M 24 (World Mining)
Hendrick Mfg. Co. 112

Industrial Air Products Co. 98
Ingersoll-Rand Co. 24
International Harvester Co. 17
International Smelting & Refining Co. 105

Jeffrey Mfg. Co. 80
Johnson, Herbert Banks 90
Johnston Pump Co. 74
Joy Mfg. Co. 4, 5 Inside Back Cover

Kamphausen Co., Dan 106
Kelly, John E. 116

Lake Shore Engineering Co. 70
Laylander, Philip A. 116
Ledoux & Co. 116
Le Roi Co. 14, 15
LeTourneau-Westinghouse Co. 8, 9
Link-Belt Speeder Corp. W M 20 (World Mining)
Longyear Co., E. J. 11
Lubriplate Div., Fiske Bros. Refining Co. 113
Lundberg Explorations, Ltd. 90

Machinery Center, Inc. 119
Magma Copper Co. 115
Marion Power Shovel Co. 7
McCary, Phillip H., Jr. 90
McClintock, R. S. 116
Meissner, Engineers, Inc., John F. 90
Merrick Scale Mfg. Co. 110
Miller, Arnold H. 116
Morse Bros. Machinery Co. 92, 117
Murphy, F. M. 116

National Supply Co. 72
New World Exploration, Research & Development Corp. 116
Nordberg Mfg. Co. 89

O'Neil, A. J. 118

Pacific Foundry Co., Ltd. 93
Pacific Pipe Co. 113
Peale, Rodgers 116
Precision Radiations Instruments 86
Pressed Steel Car Co. 76 (World Mining)
Price, Franklin L. C. 116

Republic Supply Co. 23
Resisto-Loy Co. 102
Ruderman Machinery Exchange 119

Sahara Oil Co. 99
Sanford-Day Iron Works 22
Sauerman Bros., Inc. 92
Simplex Wire & Cable Co. 39
Smit, Anton & Co., Inc. 92
Smith Engineering Works 34
Smith-Emery Co. 116
Smith, Paul F. 118
Standard Oil Co. of California 19
Stearns Roger Mfg. Co. 76
Still, Arthur 116
Stoody Co. 82

Thermoid Rubber Co. 18
Thor Power Tool Co. 66
Timken Roller Bearing Co. 30
Traylor Engineering & Mfg. Co. 73

Udy, Marvin J. 90
Ultra Violet Products, Inc. 113
Union Oil Co. 26
United Rubber International W M 23 (World Mining)
United States Steel Co. 33

Van Waters & Rodgers, Inc. 116
Vulcan Iron Works 78

Walvoord Co., O. W. 116
Wedge Wire Corp. 86
Western Machinery Co. 68
Western Rock Bit Mfg. Co. 32
Wilfley & Sons, A. R. Outside Back Cover
Wilfley, Clifford R. 116
Wilson, Clyde H. 116
Wilson, Glenn B. 118
Winslow Engineering Co. 98
Wolf, Harry J. 90
Worthington Corp. W M 21 (World Mining)
Wood, Assaying Co., Henry E. 116

Yuba Mfg. Co. 75

CLASSIFIED SECTION

8 pt. type 12c per word. 10 pt. type 18c per word. Minimum charge $4.50.

(For Box numbers addressed to Mining World, add 50c)

Boxed ads (display) in either Market Place or Classified Sections—$7.50 per column inch.

(See Market Place Section for lower contract rates).

Closing Date: If proof required, 1st of preceding month, otherwise 10th.

Business Opportunities

FOR LEASE: On royalty basis; gold placer mine in Sierra County; engineer reports 22 million yds. gravel; ample water available; roads; good buildings; elevation 3000 to 3500 ft. Contains promising prospect assaying $25 to $40 per ton. Want operator with modern equipment. Reply Box H-3, MINING WORLD, 121 Second St., San Francisco 5, Calif.

FOR SALE

Large group of developed lead-silver mining property. Open for inspection.

119 So. Knox St. Denver, Colo.

COPPER MINE in Arizona near Ver extension requiring working capital. Excellent engineer's repo and map available. Also a gold placer. Write Watchung Mountain Estates, No. 6 Broad Street, New York 4, New York. Phone BO-9-9531.

MANUFACTURERS REPRESENTATIVE firmly established in Southwest wants to add equipment and supply items to complete mining line. Will work on commission only. Reply to Box G-6, MINING WORLD, 121 Second Street, San Francisco 5, California.

Positions Desired

20 YEAR EXPERIENCE in mining organization, production. Mining Engineer seeking a responsible position as a General Superintendent or similar in any country of Central or South America, Mexico. Top references. Ing. Zoltan Marikovsky, Gavilan 1444, Dep. I, (i) Buenos Aires, Argentina.

Positions Available

WANTED: ASSISTANT SMELTER SUPERINTENDENT in South Africa, technical graduate with several years experience in responsible employment in copper smelter. Reply Box G-4, MINING WORLD, 121 Second Street, San Francisco 5, California.

PRODUCT DESIGNERS AND DRAFTSMEN

Internationally prominent manufacturer of heavy machinery used in mining, crushing, cement and basic processing industries, located Midwest, has excellent opportunities for Mechanical Design Engineers and Draftsmen for research and development and new product design. Liberal employee benefits, plus exceptionally fine working conditions and opportunity for future. Write, stating experience, present employment, personal data and salary expected. Replies confidential. Reply Box H-2, MINING WORLD, 121 Second St., San Francisco 5, Calif.

LEADING DIAMOND BIT MANUFACTURER seeks sales representative with established markets now successfully handling non-competing lines. Write, giving background and references. Reply to Box G-8, MINING WORLD, 121 Second Street, San Francisco 5, California.

SALES ENGINEERS

Permanent positions open in 11 Western states. Full or part time. Prefer men with lubrication experience, or following with maintenance departments. Sell to mines. The TMCO LUBRICATOR—AUTOMATIC SELF-FEEDING PRESSURE GREASE CUP is new to West Coast but has wide acceptance among Eastern engineers and maintenance men. Large potential with volume repeat orders.

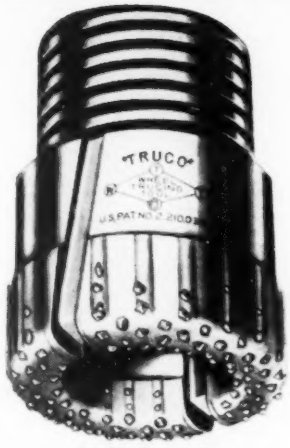
Write COQUIPCO
236 S. Coronado St., Los Angeles 57, or telephone DUnkirk 8-0586.

JOY-TRUCO Coring Bit

Here's the RIGHT Bit for You!

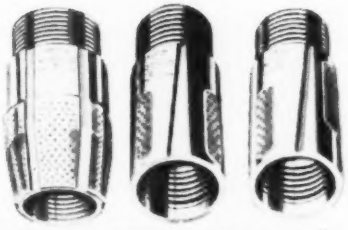
OY-TRUCO and TRUCO DIAMOND BITS

UCO Casing Bit



TRUCO Coring Bit

gnated Casing Shoe



Tapered and Strip-type Reamer Shells

All Joy-Truco and Truco bits are engineered for exceptional performance. They combine these outstanding features:

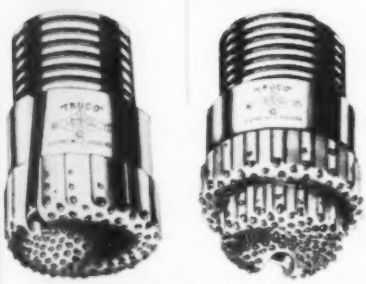
1 *Highest quality materials—the best drilling diamonds.*

2 *Patented matrix renowned for its holding qualities and resistance to abrasion.*

3 *Free-cutting design which results from precise placing of diamonds and waterways.*

These advantages are the result of constant research and experience, acquired through working in the field with mining engineers and drill operators. And Joy research goes on . . . each used bit returned for our fast, expert resetting service, is thoroughly examined to determine critical points of wear and other performance data. Each reset bit sent back to the same job, or for use on similar formations, contains corrective features which have been shown as necessary by our examination.

Why not find out about "the right bit for every formation?" Our sales and resetting service is worldwide, and a Joy diamond drill specialist is quickly available on request to check your drilling problems and recommend the bit that will do the best job for you. *Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.* In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*



Concave and Pilot Blast-hole Bits

JOY

W&D M4630

SINCE 1851—OVER A HUNDRED YEARS OF ENGINEERING LEADERSHIP

Iron ore...

...pumping at lower cost per ton

Pumping costs can be lowered and production increased with highly efficient Wilfley Sand Pumps. Wilfley Sand Pumps have earned a reputation for making actual dollar savings in operating and maintenance costs. These famous pumps operate continuously, without attention, on 24-hour schedules. Individual engineering on every application. Write, wire for complete details.

- *Cost-saving efficiency*
- *Stepped-up production*
- *Continuous operation without attention*
- *Minimum replacement of parts*
- *Designed for simple installation*
- *Economical pump size for every pumping requirement*

Companion to the Famous* WILFLEY *Acid Pump

WILFLEY
centrifugal PUMPS

A. R. WILFLEY & SONS, INC.
DENVER, COLORADO, U.S.A.

New York Office: 1775 Broadway, New York City
European Representative: Darr-Oliver Co., Ltd.
Abford House, Wilton Road
London, S.W. 1, England